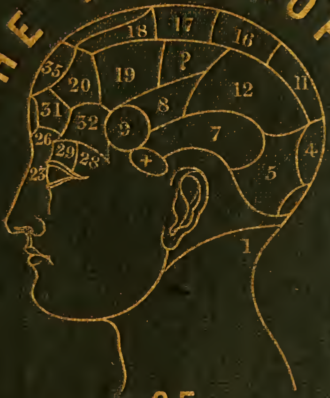
THE PHILOSOPHY



OF PHRENOLOGY.

sion; and the third thousand is issued forth in a greatly improved form, with about fifty pages of entirely new matter. We do not hesitate to characterise this as the best popular introduction to Phrenology extant, and we are surprised that it should still appear in an anonymous shape. It is well known to be

THE PRODUCTION OF THE ABLE PROFESSOR OF ANATOMY IN ANDERSON'S UNIVERSITY,

one of the most zealous and intelligent Phrenologists; and assuredly it is a work that does the highest honour to his talents. In a work so well known, it is unnecessary to enter into any minute examination of the contents; and we have therefore only to recommend all who desire a knowledge of the subject, to avail themselves of

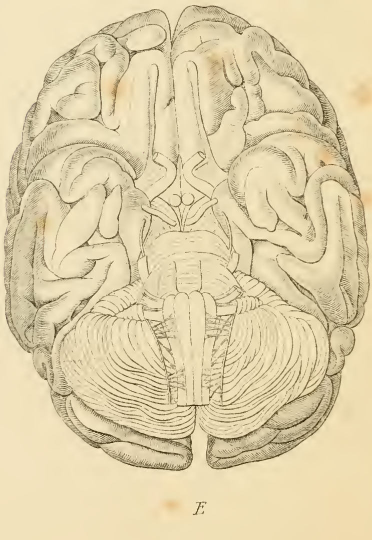
DR HUNTER'S

labours. The volume is got up in a neat portable form; and, looking to the amount of matter, and to the illustrative plates that accompany it, it must be considered at the same time as comprehensive and cheap."—*Glasgow Argus.*

Fig 1.



Fig. 2



THE

PHILOSOPHY

OF

PHRENOLOGY.

BY A MEMBER OF THE
PHRENOLOGICAL AND PHILOSOPHICAL SOCIETIES OF GLASGOW,
&c. &c.

" The dome of Thought, the palace of the Soul."—*Byron.*

FOURTH THOUSAND.

GLASGOW:
W. R. M'PHUN, 84 ARGYLL STREET
N. H. COTES, LONDON.—W. WHYTE & CO., EDINBURGH.
1845.

TO

THE MEMORY OF

GALL.

PREFACE

TO THE FIRST EDITION.

In the following pages the writer has confined himself more to the principles than to the details of Phrenology, and he has aimed at simplicity and perspicuity of style rather than elegance of diction. Every student of Phrenology easily gets acquainted with facts relating to the situation, form, and even some of the uses of the organs; but the philosophic Phrenologist looks also to principles, for without this kind of knowledge his views must be empirical, and destitute of that comprehensive character which leads to useful practical results. *Facts*, he knows, are only the insulated materials of which a science is built up, while *principles* are the uniting media that impart solidity and durability to the whole structure.

Phrenology is calculated to produce most important effects upon society; and the more widely a knowledge is diffused of the principles of Phrenological science, the sooner will these effects be realized.

Should this little work tend to produce a spirit of inquiry into the subject of which it treats, the object for which it is published will be effected.

Glasgow, *May*, 1836.

NOTE

TO THE SECOND EDITION.

A VERY large impression of the first edition having been sold off in the short space of six months, is, in the opinion of the Publisher, a striking proof not only of the high estimation in which this little work is held by the public, but also of the warm interest which the public now take in Phrenological investigations. In this edition some emendations have been made, which will probably be found interesting and useful.

TABLE OF THE PHRENOLOGICAL ORGANS.

In the engravings of the mapped heads, the situation of the organs is indicated according to the following table :—

AFFECTIVE.

I. Propensities.

1. Amativeness.
2. Philoprogenitiveness.
3. Inhabitiveness.
4. Adhesiveness.
5. Combativeness.
6. Destructiveness.

† Alimentiveness.

7. Secretiveness.
8. Acquisitiveness.
9. Constructiveness.

II. Sentiments.

10. Self-Esteem.
11. Love of Approbation.
12. Cautiousness.
13. Benevolence.
14. Veneration.
15. Firmness.
16. Conscientiousness.
17. Hope.
18. Wonder.
19. Ideality.
20. Wit, or Mirthfulness.
21. Imitation.

INTELLECTUAL.

I. Perceptive.

22. Individuality.
23. Form.
24. Size.
25. Weight.
26. Colouring.
27. Locality.
28. Number.
29. Order.
30. Eventuality.
31. Time.
32. Tune.
33. Language.

II. Reflective.

34. Comparison.
35. Causality.

EXPLANATION

OF THE

PLATE OF THE BRAIN.

In the preparation from which fig. 1st is taken, the right half of the scull is removed, and a *side view* is consequently obtained of the parts that lie within the cranium. Occupying the greatest part of the scull, we observe the *cerebrum* A, A, A, (presenting numerous convolutions). These convolutions lie immediately under the thin membranes that line the cavity of the scull. The form, size, and direction of the convolutions, seem to vary in different portions of the mass, and form important parts of the phrenological organs. These organs, it must be remarked, are not confined to the convolutions, but extend from the *medulla oblongata* C, or top of the spinal marrow, to the convolutions which they also include.

Below, and at the back of the cerebrum, we find the *cerebellum*, or little brain B, which differs remarkably in structure from the cerebrum. Instead of the convoluted, which appertains to the cerebrum, it presents a *laminated* structure; the laminæ, or plates, so arranged that their margins are turned to the circumference of the mass.

In fig. 2d, the *base*, or lower surface of the brain, is represented, and besides the *nerves* which are there found attached, a view is obtained of the three lobes of the cerebrum. A, the *anterior* lobe; B, the *middle* lobe; C, the *posterior* lobe. In this *inverted* state of the brain, the *cerebellum* D, covers nearly altogether the *posterior* lobes, but by referring to fig. 1st, the true position of these parts will be comprehended. E refers to the *medulla oblongata*, or the *top* of the spinal marrow.

From fig. 1st, a view may be obtained of the manner in which the brain fills the scull. D, D, D, represents the thickness of the scull as seen after a longitudinal section has been made from the nose to the hind-head. It will be observed, that the cerebral mass fills completely the cavity of the scull, and the scull, like the rind of an orange, or the shell of an egg, indicates, with great accuracy, the form and size of the contained materials.

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CHAPTER II.

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CHAPTER IV.

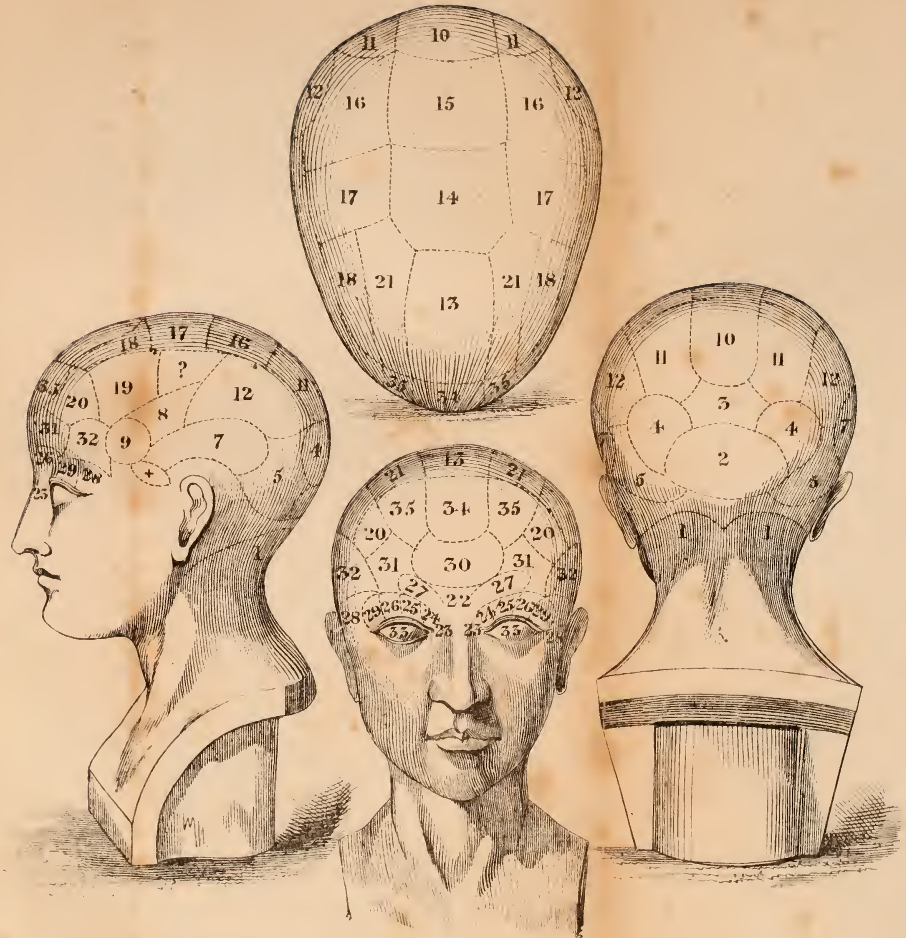
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PHRENOLOGICAL ORGANS.

Published by W. R. McPhun, Glasgow.

THE

PHILOSOPHY OF PHRENOLOGY.

INTRODUCTION.

Definition.—Causes of the Opposition to Phrenology.—Many important Discoveries have met with Opposition.—Previous to the Discovery of Phrenology most discordant Opinions entertained regarding the corporeal Seat of the Mind.—History of the Discovery of Phrenology.—Gall, Spurzheim.—Succeeding Phrenologists.—Phrenology not yet perfected.

Phrenology is the science that treats of the mental powers, and of the relationship which exists between these powers and certain corporeal conditions. In this last particular, chiefly, it differs from all other systems of mental philosophy, and, at the same time, pre-eminently surpasses them all. Many of our theories of the mind may be characterized as philosophical dreams, and, like dreams, are remarkable for their incoherency and darkness; while Phrenology has the freshness of reality stamped on its forehead, and, unlike the older theories, can be rendered subservient in many ways to the improvement of the human race.

It is to be regretted that many who oppose Phrenology do so without due consideration. Many apparently

object to it because it runs counter to their preconceived notions, of the correctness of which they have never once doubted: many oppose it because the criterion of mental capacity which it establishes is not sufficiently flattering to themselves: many raise their voices against it because the mass of mankind, who know nothing of it whatever, do not believe in it; and many laugh at it because it is more easy to laugh than to reason. With these causes in full operation, it is a matter of surprise not that Phrenology has made so little progress, but that it has made so much. But it must succeed. It is a science based on immutable truth, and has, therefore, the seeds of immortality in itself.

It is a curious and interesting fact, that almost every important discovery in science and philosophy has met with neglect or strong opposition. Pythagoras was banished from Athens, and Anaxagoras imprisoned, for promulgating novel doctrines. Was not Democrates denounced as insane, for attempting to discover the cause of madness by dissections? Was not Socrates, for demonstrating the unity of the Deity, compelled to drink of the poisonous cup? and were not many who excelled in the physical sciences, during the fourteenth century, burned as sorcerers? The truth or falsehood of any doctrine must be estimated only from its intrinsic qualities, and not from the kind of public reception it may have at first obtained. The doctrine of the earth's motion round the sun, is now generally assented to, yet Galileo, the author of this doctrine, was cast into prison, and the doctrine opposed by the most enlightened and influential of the times. The discovery of the circulation

of the blood too, a discovery which did more for the advancement of medical science, and consequently, for the happiness of the human race, than any other in ancient or modern times, was maliciously opposed, and Harvey, the discoverer, stigmatized as an enemy to morality and religion.* With these examples before us, we cannot be surprised that Phrenology should have had its own share of abuse; it has been opposed in every possible manner. The learned as well as the ignorant have united in deriding it. Argument and wit have been conjoined to decry its pretensions, and even malicious and wicked insinuations of its dangerous tendencies have not been neglected to secure its overthrow; yet it has triumphed over every effort to put it down, and the more it is opposed, the more assuredly will it triumph—error only is afraid of the light—truth never shuns discussion nor loses by investigation; and the more carefully Phrenology is examined, the more ardently it will be embraced, and the importance of its doctrines recognised and acknowledged.

Previous to the discovery of Phrenology, not only were the most discordant opinions entertained by philosophers regarding the powers of the mind, but what may appear still more extraordinary, unanimity did not prevail regarding the corporeal seat of the mental operations: some indeed believed the mind to

* "It was remarked, that no physician in Europe, who had reached forty years of age, ever to the end of his life, adopted Harvey's doctrine of the circulation of the blood; and that his practice in London diminished extremely from the reproach drawn upon him by that great and signal discovery. So slow is the progress of truth in every science, even when not opposed by factious or superstitious prejudices!"—*History of England, by David Hume*, chap 62.

reside in the brain,* but others supposed its habitation to be in various less noble parts of the body. Drelincourt and his followers, for example, allocated the mind in the cerebellum; Descartes and his disciples in the pineal gland; Aristotle in the heart; Buffon in the diaphragm; Van Helmont in the stomach. Indeed there is scarcely a vital organ in the whole body which has not been viewed as the exclusive resting place of the mind. These opinions have fled like phantoms before the light of day. Phrenology has had the merit of exposing their absurdities. Truth is always valuable for its own sake, and the establishment of the fundamental truth in Phrenology, that all mental manifestation takes place through the brain, is calculated to lead to conclusions of unspeakable importance to the human race.

It is scarcely forty years since the doctrines of Phrenology were first publicly promulgated, yet notwithstanding the extraordinary opposition it has had to contend with, it has made its way into almost every part of the civilized world. It is known even in Asia. In America many learned men have written in its behalf. In different parts of Europe many Phrenological Societies

* Among these we may make honourable mention of Hippocrates, who says, that "From *the brain only* proceed pleasure and joy, and laughter, and sport, as well as griefs, anxieties, sorrows, and weeping. By it we are wise, and understand, and see, and hear, and appreciate. By it we distinguish what is pleasant and what is disagreeable, and by it the same things do not please us under all circumstances. By it we are insane and delirious, experience terrors and fears, partly by night and partly by day; do not recognise those who are with us; lose our habits, and forget our experience. All this we suffer from the brain if it is not healthy; wherefore, I say, that the brain is the messenger and interpreter of intelligence and wisdom."—*De Morbo Sacro.*

have been formed; and in this country do we not find it taught as a branch of liberal education in many of our seminaries of learning? do we not find men, known both to science and to literature, pressing forward in its support, and the most able and respectable medical and literary periodical publications of the day ably advocating its cause, and elucidating its principles? The discovery of Phrenology is a new era in the history of the human mind. To Dr. Gall mankind is indebted for the discovery; and the discovery it must be remarked, was purely the result of observation, not of reasoning. Dr. Gall was born at Tiefenbrun in Suabia, on 9th March, 1757. Even when a boy he was noted for quick perception and talent of observation. He remarked when at school, and afterwards when he had entered the University, that all his class fellows who had a strong verbal memory had prominent eyes, and was inclined to suspect that these two circumstances held an important relationship. Had he proceeded no farther in his investigations, this observation of his would have been soon forgotten; but he fortunately conceived the idea, that if a memory for words can have any external sign, the same might be the case with the other intellectual powers. He looked for these signs in the head where they had not previously been suspected to exist, and in process of time he was convinced that he had found external characters which indicated talents for painting, for music, for mechanical arts, and for remembering places. He became afterwards acquainted with some individuals who were remarkable for the energy and particular determination of character, and he found particular parts of their

heads to be very largely developed. From such cases he was led to look for signs of the *moral sentiments* in the head, and the more he examined, he found the correctness of this general position unfolding itself. He abandoned the theories of philosophers, from whose vague speculations regarding the powers of the mind he could gain no assistance, and devoted himself exclusively to the observation of nature. That he might extend his sphere of observation, he frequently visited schools and colleges, got admission into prisons, houses of correction, and hospitals for the treatment of the insane, and procured introductions to private individuals conspicuous for peculiarity of talent. The heads of all he carefully examined ; and after a series of observations, arrived at the belief that he had discovered the particular conformations of head, which indicated *certain* dispositions and intellectual powers. Dr. Gall has been accused of first framing a theory, and then attempting to mould nature to his speculations ; but no accusation can be more unfounded. The first phrenological idea that entered the mind of Gall was the offspring of observation, and every subsequent discovery which he made was the result of numerous observations and cautious inductions. Phrenology is not a theory that was manufactured in the closet, and brought to the light of day in a finished state. No—it first appeared like so many detached and isolated facts ; and after the facts were satisfactorily established, it was wrought into an interesting system of philosophy.

In the year 1806, Dr. Spurzheim became the assistant and associate of Dr. Gall, and to him Phrenology

is not only indebted for an extension of its boundaries, but in some measure, also, for the systematic and philosophical aspect which it at present displays. With Dr. Spurzheim, the writer of these pages had the honour of being personally acquainted; and the more he had an opportunity of knowing him, the more he was convinced of the philosophic character of his mind. Dr. Spurzheim had obviously investigated human nature with a most observant and critical eye, and few individuals could bring into the investigation more sagacity or intellectual profundity; his manners besides were simple and unaffected, and candour and love of truth his predominating characteristics. To him Phrenology is indebted for much of the progress it has made in this country. With inextinguishable zeal and ceaseless industry, he travelled over the greater part of Europe, explaining and inculcating the new doctrines, and leaving everywhere behind him indubitable evidences of the triumph of truth. He may be viewed as the father and apostle of the new philosophy in Britain ; for had he not combated personally and so successfully as he did the opposition which Phrenology first experienced, phrenological truth might have been left to make its own way; and unless truth is known it can neither be believed nor turned to any practical advantage.

After sojourning for some years in this country, he repaired to America, where he terminated a life devoted to Phrenology.

Great though the merits of Spurzheim be, we cannot agree with those who attempt to raise him to an equality with Gall. The glory of the discovery is due to Gall alone ; and all the merits of Dr. Spurzheim, transcen-

dent though they be, are in comparison with the discovery, only of secondary importance. Gall was the great luminary from which succeeding phrenologists derived all their lustre.*

Phrenology is a science of observation, and superior, consequently, to all the systems of mental philosophy that ever existed. Phrenology professes to rest upon facts palpable to the senses. It takes nothing for granted. It is a science of positive knowledge. If the fundamental principles of such a science be well-founded, it ought to be supported and cherished, even though some of its details were shown to be false, because in every science of observation errors are apt to be committed; but time in such a science invariably rectifies them all. The fundamental principles of Phrenology are admitted to be true, by many who do not believe in the details of the science. Indeed the general principles of the science cannot be disputed; and we feel, therefore, perfectly at ease regarding the ultimate triumphs of the science in all its details. That Phrenology is not yet perfected we may frankly admit —for no science has been perfected in a day. That new organs are yet to be discovered, appears more than probable, as some parts of the brain exist to which phrenological observation has not yet extended; and

* Although this last observation is literally true, yet it must be stated that Phrenology has been much advanced by the observations and labours of other philosophers. Among these, Mr. Combe stands pre-eminent; and although he has neither the genius of Gall, nor the profundity of Spurzheim, he has done more than either in extending and popularizing the science. Like Socrates, he has had the merit of drawing philosophy from the clouds, and adapting it to the ordinary affairs of human life.

that changes may yet be effected on the relative size and position of the discovered organs, is probable, as we have not yet the data upon which the precise boundaries of the different organs can be ascertained. It would be foolish, indeed, to suppose that Phrenology is completed, or is incapable of alteration or improvement. It is enough that the foundation of the science is a rock of truth, and that the principles of the science are in conformity with the eternal fitness of things and constitution of nature. Time and the co-operation of many minds will bring Phrenology, in all its details, to perfection: much has already been achieved, and we may be allowed to augur favourably of what is yet to be performed.

CHAPTER I.

The Brain the Organ of the Mind.—Some popular Objections to Phrenology answered.

It is the opinion of some philosophers, that the mental powers are not dependent upon the body. But if there is a shadow of truth in such an opinion, Phrenology must fall to the ground. But, independently of the fact that mental manifestation is never evinced without corporeal parts, do we not uniformly find the mental powers increase and strengthen with the growth and energy of the body, and with the decay of the corporeal system, dwindle and disappear. No man can unbiassedly contemplate the dawning of intellect in the child, the full expansion of the intellectual powers in middle age, and the dotage and mental imbecility which characterize the advanced periods of life, without arriving directly at the conclusion, that the peculiarity of mental condition is dependent on the peculiarity of the corporeal state. But is it the whole body or a part of it that is so intimately connected with mind? To such a question we are enabled to give a decided and satisfactory answer. The human body consists of an assemblage of organs, each of which has its separate and determinate function. Besides the organs which we consider necessary for the manifestation of the mental powers, there are others which experiment and observation prove to have been formed for very different purposes. We have organs

of digestion, absorption, circulation of the blood, respiration, secretion, motion, sensation, voice, and reproduction. It would be obviously absurd to suppose that any of these organs is directly concerned in the manifestation of the mind, and this conclusion is strengthened by the following considerations :—

1st. These organs have their ascertained functions, which have no relationship to the phenomena of mind.

2dly. Many of these organs may be removed from the body without impairing the mental faculties ; and,

3dly. Those which cannot be removed without destroying life are found existing in the fullest development in many of the inferior animals whose mental capacities are of the lowest order.

Phrenologists believe that the BRAIN is the material organ of the mind ; and they believe this because they think the fact is unquestionable, or may be proved as satisfactorily as any other doctrine in physiology. Some opponents of Phrenology have, however, questioned the truth of the position, and asserted that we have equal reason for believing the other vital organs to be organs of the mind, as we have for arriving at that conclusion regarding the brain.* We can no more think, they say, without the lungs or heart than without the brain, *ergo*, the heart and lungs are mental organs as well as the other. Such a conclusion, if not illogical, is at least inconsistent with the known operations of the animal economy. By the same kind of argument we may prove the heart to be a *respiratory* organ, for by removing it from a living animal, respira-

* Edinburgh Review, No. 88.

tion instantly ceases; nay, by similar logic we may prove that all the vital organs are united in performing one function—indeed any function that may be condescended upon, for by destroying *one* vital organ all the others immediately cease to act. The man, however, who has studied the laws of the animal economy knows, that though all these organs are linked together and conspire to effect one great end, the continuance of life, yet he also knows that each organ serves a determinate purpose in the living system, for which purpose it was formed and for no other. The lungs, he knows, are a respiratory and the stomach a digestive organ. He knows also they are as necessary for our existence as the air we inhale and the food we digest, but he would no more ascribe intelligence to these organs than he would ascribe intellectuality to the air or food. But it is far different with regard to the brain. Throughout the whole of nature, so far as our observation reaches, and in philosophical argument we dare not proceed farther, mind and brain are never found disunited. Wherever we find brain there also we find mind, and in proportion to the development of the brain, do we find a corresponding development of intellectual power. There are no exceptions to this general law. What are we to think, then, of those cases adduced by the opponents of Phrenology, in which the brain is said to have been lost without affecting the intellectual powers. They are just as worthy of credit as the exploits of the renowned Baron Munchausen, or the picturesque imaginings of the "*Arabian Nights*." It is surprising that any man can be found who is so credulous as to believe them.

——— ——— ——— "The times have been
That when the *brains* were out the man would *die*,
And there an end: but *now* they *rise* again
With twenty mortal murders on their crowns
And push us from our stools: This is more strange
Than such a murder is."

Shakspeare insinuates that it is a strange matter for a man to live without brains, and Shakspeare is undoubtedly right; but the opponents of Phrenology, in contempt of this high authority, maintain that nothing is more common. We have been somewhat puzzled to account for the existence of such an opinion, and after much cogitation, have come to the conclusion that it is rather attributable to error of judgment in the opponents of Phrenology, than incorrect observation. Observing, probably, with how small a quantum of brains they themselves have not only contrived to live, but to live comfortably, they have drawn the conclusion that they could live equally well without brains altogether; and although some may be ready to acquiesce in the justness of such reasoning, still, viewing the subject phrenologically, their argument is obviously as unsubstantial as the vacuity of their brainless crania. But to return to the subject more immediately before us, it is only necessary to observe that the cases alluded to are unworthy of credit; they have not even the semblance of genuineness, and not a single medical man of the present day would be so foolish as to confide in them.

That certain parts of the brain have been lost, and the person afterwards recover, with the use of his intellectual faculties, cannot be doubted; but this can be satisfactorily accounted for without affecting the

fundamental principles of Phrenology. The brain is *double*, and all the organs of which it is composed are arranged in pairs, like the organs of sensation. We may lose an eye, but vision still remains ; or an ear without hearing being destroyed : so likewise, although an organ of the brain be injured, or even lost, if its fellow of the opposite side remain unaffected, the function of the organ must necessarily remain. But is there any case on record in which both organs have been destroyed, and the functions attributed by Phrenologists to the parts afterwards continue ? There is not one.*

That the mind is directly connected with the brain, we indisputably prove from the effects of *cerebral diseases* and *injuries* of the brain upon the intellectual powers. Inflammation of the brain is uniformly attended with delirium. So long as the inflammation is in an acute state the delirium continues, and when it terminates in an effusion of serum or pus,

* "I will not insult the understanding of my readers," says Dr. Elliotson, "by showing that we have no authentic instance of the real absence of brain in the cranium of a being possessed of a mind. In most cases where the mind is *said* to have been vigorous, when the state of the body at large, or of the brain alone, rendered the perfect performance of the cerebral functions improbable, in the eyes of the relators I believe the mental power has been greatly overrated ; that because the individual merely talked collectedly, he was imagined sufficient for the exertions of his best health.

"The part of the brain affected by disease, may have been one whose function is not intellectual, but merely relating to the feelings, or may have related to mental faculties whose state was not noticed by the narrators. In truth, the narrators give us no satisfactory account of the feelings and intellectual powers of the patient, nor of the exact portions of the brain affected; nor could they, being unacquainted with Phrenology ; and they also forget that the cerebral organs are double.' —*Human Physiology*, *5th Edition*, p. 37.

which exerts a deleterious pressure upon the brain, the intellect is overpowered and ultimately incapable of being manifested. However striking such facts may be, we have still more convincing illustrations from the effects of depressed portions of the skull. If a portion of the cranium is beat down upon the brain, that instant sensibility and consciousness cease, and as soon as the brain is freed of this incumbrance its functions are restored, sensibility and consciousness return.

The following cases will illustrate this subject, and tend also to prove that the brain is the material instrument of the mind.

1st. *Effects of effusion of blood under the skull, and exterior to the dura mater.*

" H. O. a young man fell in the evening through the scuttle of a store, but rose immediately, mentioned the fall to some of his acquaintances, and transacted business during the evening. Next day he was found in bed in nearly a senseless state, and soon became incapable of speaking, hearing, seeing, or swallowing, and appeared to be dying. There was no evidence of any fracture of the skull, and but very slight appearance of any external injury whatever. A small swelling over the right ear, and the conviction that he could live but a few minutes in the state in which he then was, determined his medical advisers to perforate the skull. I removed a small portion of the bone beneath the slight swelling over the ear, by the trephine, and found more than a gill of clotted blood which had probably flowed gradually from a wounded blood-vessel. On removing this blood, the man immediately spoke, soon recovered his mind entirely, and is now, six weeks

after the accident, in good health both as to body and mind." (*Influence of Mental Cultivation and Mental Excitement upon Health, by Amariah Brigham*, p. 16.)

2*d. Effects of effusion of blood* INTO *the brain.*

Apoplexy, we know from actual observation, arises generally from a rupture of some blood vessel of the brain, with an effusion of blood, and consequent compression of the cerebral substance ; and what are the usual symptoms of apoplexy ? In the Cyclopœdia of Practical Medicine, they are thus described. "Sometimes the attack is nearly instantaneous and complete, the patient previously in apparent health, falling down insensible with an immediate abolition of all the sensorial functions. On other occasions the approach of the stroke is felt by the patient : he puts his hand to his head, or makes an alarming exclamation of something unusual felt in the head : and then falls down insensible." (*Article Apoplexy Cerebral.*)

3*d Effects of pressure upon the brain artificially produced.*

"A woman about 50 years of age had an extensive carious affection of the skull : the left parietal bone was destroyed in the greatest part of its extent, and left *uncovered a considerable* portion of the dura mater."—"I wiped off the sanious matter which covered the *dura mater*, and I at the same time questioned the patient on her situation. As she felt no pain from the compression of the cerebral mass, I pressed down lightly the pledgit of lint, and on a sudden the patient who was answering my questions rationally, stopped in the midst of a sentence, but she breathed and her pulse continued to beat : I withdrew

the pledgit: she said nothing: I asked her if she remembered my last question. She said she did not. Seeing that the experiment was without pain or danger, I repeated it three times, and thrice I suspended all feeling and all intellect." (*Elements of Physiology, by Richerand, 3d Edition*, pp. 322 & 339.)

4*th. Effects of Pressure upon the brain from fractures and depressions of the skull.*

When depressed portions of the cranium or effusion of blood upon the brain from external or internal causes, produce general effects upon the body and the mind, the *cause* acts upon the whole cerebral mass. There is an encroachment upon the cranial cavity—the brain is compressed into a smaller space than natural, and its functions generally impaired or arrested. This is only what might have been anticipated. From the very structure and arrangement of the contained parts a *partial* derangement cannot frequently occur, but when it does happen the effects both upon the body and mind are also partial, paralysis or insensibility of one half of the face it may be, and a weakened or deranged condition of one or a few of the powers of the mind.

A soldier, at the battle of Waterloo, had a portion of skull depressed, attended with the usual symptoms of general insensibility and incapability of movement, inconsciousness of existence. The surgeon, Mr. Cooper, raised up the depressed portion from the brain, and the man rose, dressed himself, talked rationally, and was soon perfectly well. (*Principles of Military Surgery, by John Hennen.*)

Cases of this kind have fallen under the observation of almost every surgeon, but probably the most remarkable

case on record is that related by Sir Astley Cooper. A sailor, he tells us, fell from the yard-arm of one of his majesty's ships as she was about to sail from the Mediterranean to Gibraltar. The poor fellow was taken up in a state of total insensibility. During his passage to Gibraltar, he evinced no symptom of sensibility farther than moving occasionally his finger, or projecting the point of his tongue from his mouth. In this log-like state he was regularly fed and freed of his involuntary discharges till he arrived at Gibraltar. There he remained for a month in the same torpid state under varied plans of medical treatment. In process of time he returned with the ship to England, and thirteen months from the accident was carried in the same state of absolute insensibility into Deptford. From Deptford he was carried into St. Thomas's Hospital, London, and placed under the care of Mr. Cline. This eminent surgeon found a portion of skull depressed, to which he attributed all the symptoms. He raised it up, and mark the effects of the operation. The bone was no sooner elevated than the patient sat up, gazed around him, and in a short time began to speak. He supposed he was just ready to sail for Gibraltar, and the thirteen months which elapsed between the accident and the performance of the operation, was a blank in his mental history which appeared to him only an instant of time. Will a piece of bone pressing upon any other organ produce corresponding effects upon the mind? The ribs have been thrust in upon the lungs and heart, and the bowels have protruded from their cavity, and been subjected to great degrees of violence, while the mind

unaffected within its citadel, has beheld with calmness and serenity the ravages of the outward storm; but let the *brain* be seriously affected either by internal or external causes, let the brain be the seat of the commotion, and the mind cannot remain undisturbed, it is hurried along with the tempest—maddened it may be into fury, or laid prostrate and overwhelmed.

From these and numerous other facts of a similar kind which can be adduced, it appears to be satisfactorily established that the brain is the organ of the mind; and if this cannot be denied, Phrenology has at least some foundation in nature. The man who admits that the brain is the organ of mind, is virtually a Phrenologist; for he cannot stop here, he must go farther and admit, that the state or condition of the brain must influence the mental powers. We admit the correctness of the general principle, that the state or condition of an organ has necessarily an effect upon the function of that organ, and we dare not in logical correctness refuse our assent to the principle when applied to the brain. The eye is the organ of vision, and we unhesitatingly admit that a well formed and sound eye are indispensable to perfect vision. Muscles are organs of motion, and we never doubt for a moment that different degrees of muscular development are concomitant with different degrees of muscular power. If the state or condition of an organ then affects the functions of that organ, it follows necessarily that the development and other conditions of the brain will affect the mental manifestation.

There are many physiologists who admit, in a general way, that the brain is the organ of the mind, but who

object to the phrenological view of the subject that the brain is a *congeries* of organs, through which a plurality of mental powers are manifested. If the mind, however, manifests a plurality of mental powers, and if the brain be that part of the body through which these powers are displayed, it is *a priori* probable that the brain is not a single organ. It would be far more consistent for the opponents of Phrenology to deny any connexion between mind and brain, than to admit that connexion and yet consider the brain as a single organ, capable of manifesting a diversity of mental powers. What would we think of the man who would run into the absurdity of attributing all our sensations to the operation of *one* external organ of sensation, yet are not the various feelings and powers of the mind as different from each other as seeing, and hearing, taste, smell, and touch? We are conscious that our impressions from external objects are different in kind, and observation has proved that we have a corresponding diversity of external organs ; we are also conscious that the mind manifests a plurality of powers; is it not therefore probable that nature has allotted for the manifestation of these powers a corresponding diversity of cerebral organs?

But have we as much reason to believe in the existence of the cerebral organs as in those of the external senses? To this question I would answer that the evidences on which the existence of both kinds of organs rest, are precisely of the same character. The organs of sensation no doubt obtrude themselves more upon our observation than the other. From their external situation, insulated state, and peculiarity of

structure, they cannot be overlooked or confounded, but how do we determine that they are organs of sensation. By observation only. Now, it must be remembered, that by the same means we can discover the organs of the brain.

It has been said, that if the organs of the brain exist, the mind must be *conscious* of their existence, and that anatomical investigation would set the matter at rest; and it has been still farther remarked, since the mind is not conscious of their existence, and since anatomical investigation leaves the matter still in doubt, such organs can have no existence save in the imagination of the phrenologist. The argument is deserving of consideration; but it is more plausible than solid. That the mind has no consciousness of acting through the instrumentality of cerebral organs, we admit; but the conclusion cannot be legitimately drawn from such premises that *the organs* do not therefore exist, for the mind is not *conscious* of the existence of any corporeal organ which it uses. That we *know* that the mind uses such organs is incontestable; but knowledge and consciousness are very different things, though frequently confounded. Knowledge is something which the mind acquires by experience, and consciousness the capability which the mind possesses of attending to its own perceptions. Now we know that we see with the eye, because we have acquired this knowledge by a multitude of observations; but in the early periods of life, before these experiments have been made, we see, and hear, and receive impressions from the external objects that surround us, without our knowing that the impressions are received through an external organ at

all. And even in the most educated and expanded state of the mind, though the mind may reason on the nature of the impression, the mind is no more conscious that the impression is made on an external organ, than it is at the moment of birth. In *seeing*, for example, the impression is made on the optic nerve, but how few know of the existence even of that nerve! All sensations are produced through the medium of the nerves, but do we all know the situation even of the nerves? And if we cannot indicate the locality even of such organs, it is absurd to say that the mind is conscious of their operations. If this reasoning can apply to the external senses, the existence of which is so palpable, can we admit that a non-consciousness of the operation of the internal organs is a proof of their non-existence?* But if these organs exist, have we not only to remove the osseous and membranous envelopes which nature has thrown around them, and they would at once be apparent? But on exposing the brain, we meet only, it is said, with a number of *cerebral convolutions*, not differing much either in size or external conformation, and not arranged into different pieces with nice insulating lines of circumvallation, as we find portrayed on the

* At the same time we have an obscure internal feeling that almost amounts to consciousness, that the mental operations are carried on in the head. We never suppose for a moment that we think with the stomach or foot; when we wish to recall any thing to memory we instinctively apply our hand, not to the chest or abdomen, but to the head. The language in common use to designate mental conditions arises from this cause. We say that a stupid fellow is a block*head*, a numb*skull*, has no *brains*, is addle*pated*, &c. We say also that a clever person is long-*headed*, strong-*headed*, has a good *head*, has *some brains;* that a silly volatile being is light-*headed;* and a madman is *wrong* in the *head*, or not right in the *upper* storey.

phrenological crania; and not finding the cerebral parts arranged as they in their wisdom expected, the opponents of phrenology have come to the conclusion, that whatever these convolutions may be, they are clearly not organs of the mind. But may not this conclusion be too hastily drawn? Were we to reason in the same way regarding many other parts of the body, we would unquestionably fall into error. Nerves of sensation and motion resemble each other more than any two convolutions of the brain; yet motion and sensation are functions as different as any two powers of the mind. These nerves are not only similar in form and structure, but they are also bound together and surrounded by a common sheath or envelop. What would we think of that physiologist who would contend, from these circumstances, that nerves are all of one kind? We would say that he has yet to learn the rudiments of physiology, and that he has promulgated a doctrine which experiment and observation have confuted. Erroneous though the principle be which would lead to such conclusion, yet the opponents of Phrenology have all along been acting upon it, when contending against the plurality of the cerebral organs. They have proceeded upon the principle that *similarity* of structure indicates *identity* of function, but the unsoundness of the principle is triumphantly displayed by a reference merely to the nerves of motion and sensation.

Again, the intestinal canal is a continuous musculo-membranous tube, extending from the mouth downwards, and, from the manner in which its different parts are coiled upon each other, presenting, like the brain, a number of convolutions; yet however continuous and

similar are all the parts of this tube, we never doubt the existence of distinct organs. One part of the tube is an organ of deglutition, another of chymification, a third of chylification, and a fourth of fœcification. Reasoning, like the opponents of phrenology, that because these parts are neither different in structure, nor insulated like the external senses, we must come to the absurd conclusion that they are not distinct organs. There is nothing then in the phrenological doctrine at variance with anatomy. The structure and arrangements of the cerebral organs may not be such as might *a priori* be expected ; but who could tell *a priori* what would be the structure of an organ of the mind ; nay, who could tell *a priori* what would be the structure of any organ ? We cannot *calculate* the structure of an organ from its function, or the function from any given structure. There is nothing in the structure of the optic nerve that would lead us to the conclusion that it is an organ of vision, or of the auditory nerve that it is the essential part of the organ of hearing. When the function is once discovered, we can then generally find an adaptation of the means to the end, a correspondency between the structure and function ; but a knowledge of structure alone will not necessarily lead to a knowledge of function. Were it otherwise, the discovery of the function of every organ would be simultaneous with the discovery of its structure, and we would long ago have found out the uses of the spleen, the thyroid, and the thymus glands, the supra-renal capsules, the vermiform process of the cœcum, &c., the functions of which are still problematical.

If the function of an organ, then, cannot be discovered

by a knowledge of its structure, how can it be discovered? By experiment or observation. Phrenologists endeavour to discover the functions of the cerebral parts by observation, and seeing our knowledge of the functions of the external senses has been obtained in this way, they do not despair of arriving at an equal degree of certainty regarding the functions of the internal organs.

But are not the internal organs altogether beyond the reach of observation? Are they not surrounded with bone, covered still farther with a certain depth of soft parts, and as if nature wished to thwart all such investigations, has she not shrouded them in still greater darkness by the luxuriant drapery of hair which she has surmounted to the whole? Is it not, therefore, clear, that though the organs existed, as indicated by Phrenologists, that they never could be discovered in the living state, and that Phrenology would thus be reduced to a dead letter, or at best fitted for the closest speculations of the physiologist?

In reply to this popular objection it must be remarked that the brain gives the form to the head, and whatever may be the thickness of the cerebral envelopes, they never impart a shape to the head materially different from that of the brain. The brain, it is particularly to be observed, is the first part of the head that is formed, and the skull is moulded round the delicate organ. It is not the skull that gives the form to the brain, but the brain that gives the form to the skull; and whatever peculiarity of conformation the former may possess, is uniformly and necessarily imparted to the latter.

After the middle period of life, indeed, the *frontal sinuses* expand, or in other words, the tables of the skull at the lower part of the forehead separate, and thus form two cavities which communicate with the nostrils. The formation of such cavities, however, cannot take place without protruding to a certain extent the outer table of the skull, and thus a prominence is formed for which we have no corresponding cerebral development. I am surprised at the importance which has been attached to this fact by the opponents of Phrenology. They seem to view it as a triumphant refutation of the whole science, as if these sinuses altered the general configuration of the head. But if the fundamental principles of the science can be proved to be well-founded, the existence of these cavities must be viewed only as a difficulty in the practical application of the science, and a difficulty which a little experience will enable us easily to overcome. It cannot invalidate Phrenology as a science ; for if the cerebral organs are there, such cavities can neither increase nor diminish the internal power ; they only add a little to the difficulty of ascertaining it. These nasal cavities do not exist at the earlier periods of life, and cannot at these periods affect our judgment regarding the cerebral development. And even when they do exist they can easily be recognised, and the requisite allowances made in calculating the size of the cerebral organs.*

* It is an interesting fact that some of the organs over which the sinuses lie, were discovered in boys, and consequently before the sinuses were developed.

CHAPTER II.

The Brain not a single Organ proved:—from the Mind displaying different mental Powers—from Diversity of Form in the Brains of different Individuals—from Diversity of Talents—from partial Idiocy and partial Insanity—from Dreaming—from Mental Phenomena that result from Injury or Disease—Anatomy in Harmony with Phrenology.

HAVING thus attempted to prove that the brain is the organ of the mind, and endeavoured to obviate some of the objections which lie at the threshold of our investigation, we are now prepared to enter a little farther into the subject, and to consider the grounds on which the plurality of the cerebral organs rest. We might prove the truth of the phrenological doctrine generally, and consequently, of the plurality of organs on which Phrenology is founded, by appealing to experience and observation, for these are the tests to which it will ultimately be referred. But as this line of argument would be considered unsatisfactory by many, we shall attempt to prove the existence of the organs of the brain from certain facts and observations which all, or almost all, admit.

1st. It cannot be doubted that the mind displays a plurality of powers. All metaphysicians in explaining the phenomena of the mind proceed upon this supposition; and to show how little guided they have been by correct principles we have only to observe the diversity of opinion that exists upon the subject; some enumerate only three such powers, as sensation, memory, and judgment; others add attention, imagina-

tion, association of ideas, and some reckon up more than twenty fundamental powers. Of the correctness of such views we do not at present speak. We only state these facts to show that all metaphysicans admit that the mind displays more than one power, and if we have established the fact that the mind manifests its powers only through the medium of the brain, it follows that a plurality of mental powers can only be manifested through a plurality of cerebral organs.

2d. There is no internal organ of the body that assumes such a diversity of form in different individuals as the brain.

The liver, for example, may vary in size in different individuals, but in the healthy state, generally speaking, all its parts bear the same relative proportion to each other. But it is far otherwise with the brain. Besides the immense variation of size in the whole brain in different individuals, we find an equal if not a greater, diversity in the proportions of the subordinate parts. Many have the anterior* lobes small, while the middle* and posterior* are greatly developed. On the other hand, not a few are found with the middle or posterior lobes small, and the anterior ones in the greatest development. Some have the greatest portion of brain at the base of the skull, while others have that part narrow, and the most expanded portion at the top of the head. Besides these differences of form in the great outlines of the head, there are others of a subordinate character which are no less remarkable. Each convolution of the brain may be developed in different

* See Plates 3 and 4.

degrees, and thus the incalculable varieties of form in the human head can easily be accounted for. Sometimes a single convolution arrives at the maximum of development, while those in the vicinity are only of a moderate size ; the part thus superiorly developed assumes invariably a certain form, and gives a characteristic prominence to the skull over that part of the brain, which the experienced eye can easily discover. Are these diversities of form of no consequence? Is it immaterial at what part of the cerebral mass the greatest development is found? Will a man with a small forehead and an expanded hindhead think as profoundly as the man whose greatest proportion of brain is in the forehead? No man who has studied nature carefully can answer these questions in the affirmative. Look at the head of a man of a grovelling and sensual character and you will find the greatest part of brain behind the ear. Compare the head of such a character with another of an opposite description, and the difference will at once be apparent. The intellectual character has always a large proportion of brain before the ear, and a beauty thus appertains to such a head which can never be imparted to the other. The Grecian and Roman sculptors were celebrated for their nice imitation of nature, but the heads of their gladiators and philosophers are always represented differently, and in strict conformity with phrenological principles. They had never heard of Phrenology, yet they never once violated its principles, because its principles are founded in nature, and they took nature only for their guide.

The opponents of Phrenology have insinuated that

Dr. Gall first mapped out the skull into so many compartments, and then tried to mould nature to his speculations ; but this is not a correct reading of the history of Phrenology. Dr. Gall, on the contrary, as we have already shown, first observed a correspondency between particular mental powers and particular prominences or particular conformations of the head, and it was only after repeatedly observing the concomitancy between the power and the conformation that he *held* the relationship as inseparably connected. Phrenologists maintain that Gall's observations are correct. Their experience coincides with his, and they challenge any one to adduce an instance in which the power exists without the cerebral development.

3d. The diversity of talents among men, and the existence of partial talent in individuals, can only be explained satisfactorily on the supposition of a plurality of mental organs. We are aware that the peculiarity of talent and disposition in mankind has been attributed by metaphysicians to *circumstances.* The mind of the infant has been compared to a sheet of white paper on which any kind of character may be traced. You may train up a child, they say, to be a poet, or a painter, or a musician ; or you may make him, as you please, either remarkable for every good and amiable quality, or for every low and degrading vice. But are these views of human nature consistent with experience ? Are there not some individuals who cannot be made poets, or painters, or musicians ? and are there not individuals who have evinced from their earliest years amiable tempers and dispositions of mind, and others who exhibit every

thing the reverse? If all children have not the same temper and disposition at birth, to what is the difference to be attributed? Not surely to circumstances, for they have not had time to operate, but to something in themselves. If circumstances can form the intellectual and moral character of man it is clear that they can only do so either by creating mental powers, or affecting in some particular way the powers which have been already given him by nature. That circumstances can draw forth talents we admit, but that they can create mental powers is so inconsistent with observation that we cannot believe it. If circumstances can create powers, why can we not make an idiot a philosopher? We naturally say that *that* is impossible; they have not the capacity, and the co-operation of all the circumstances on earth cannot impart the talent or capacity to them. All talent is inherent, never the result of external causes. Favourable circumstances will, no doubt, do much to improve or render available talents that already exist. They can do no more; but they can obviously never make them.

We all admit with Horace, that "poeta nascitur non fit;" but if this maxim is just with regard to the poetical talent, it is equally just with regard to talent of every other kind. If talent be inherent then, and the brain a *single* organ, by means of which the mind manifests its powers, it follows that a man who is remarkable for any one talent should be equally remarkable for every other. But we know that there are men who show a talent only in one way, and who beyond their own province are perfect fools. Is the man who excels in poetry necessarily a good mathema-

tician? or the mathematician necessarily a great poet and orator? To maintain that because a man excels in one pursuit he must necessarily be capable of excelling in every other, is just as preposterous as to maintain that because a man sees well he must necessarily hear, and have all the other external senses in equal perfection. That some men have a variety of talents is unquestionable; but the majority of mankind possess only moderate mental powers, and among these how often do we find an individual who displays in a degree which astonishes every one, a particular talent. Even a talent of this kind has been evinced by idiots, whose mental powers were otherwise so weak that they could not comprehend the meaning of the simplest proposition. It is evident then, that mental powers exist in the same individual, at the same time in various degrees of strength and in various degrees of aptitude for improvement; and, as the brain is the part of the body through which the mind manifests all its powers, it follows incontrovertibly, that the brain cannot be a single organ, else all its powers would be manifested in an equal degree, but must be an aggregate of parts, or a congeries of organs, each part or organ manifesting a particular power.

4th. The plurality of the cerebral organs may be deduced from the existence of partial idiocy and partial insanity.

No system of mental philosophy except the phrenological can explain satisfactorily the two conditions of the mind called *idiocy* and *insanity*. To say that the one is mental imbecility and the other mental derangement, affords no explanation, nay, it leads to the suppo-

sition that the *essence* of the mind is affected. But while Phrenology leads to no such dangerous conclusion, it enables us satisfactorily to explain these two very peculiar conditions of man. Idiocy always arises from a defective organization or development of the brain, and insanity always from diseased cerebral structure. If the whole brain be defective in its organization or development, the idiocy is complete; or if the whole brain be diseased, as in inflammation or excessive intoxication, the insanity is complete; but idiocy and insanity are often partial, and there is no way of explaining such phenomena satisfactorily but on the supposition of a plurality of cerebral organs. Some idiots have shown a talent for music, others for imitation, others for calculation, and others for constructing mechanical instruments; and it is well known that many persons are insane on *one* subject only. If the brain was a single organ, through which the mind manifested all its powers, these mental phenomena never could occur; for, if the brain was sound, all the powers would be equally manifested, or if diseased, all the powers would be equally affected. But as some of the mental powers in these instances are strong and others weak, some of them affected and others unaffected, it clearly follows that all the parts of the brain cannot be in the same state, or the brain is not the organ of thought. If we are forced to admit this, we must also admit that the parts of the brain in these different or opposite states are parts through which different powers are manifested, and we thus arrive directly at the conclusion of a plurality of cerebral organs.

5th. The plurality of the cerebral organs may be proved from the phenomena of *dreaming*. During *sound* sleep we are quite unconscious of existence, and when this takes place the whole brain is in a state of inactivity or torpor. All corporeal organs require rest; and during the repose of the brain the mental powers are enveloped as in a thick cloud. But the sleep is often partial, or as we say, disturbed by dreams. We seem to ourselves to be engaged, it may be, in furious or deadly combat, or as peacemakers, soothing the ruffled spirits of others, and tendering our warmest solicitudes for a reconciliation. We may seem engaged in some complex and harassing calculation, or in reading some interesting work of literature or science. Or the imagination may take wing and carry us into Elysian fields, where the eye delights to rest on the enchanting scene, and the ear to be regaled with the songs of the birds of paradise. These may be viewed as specimens of simple dreams ; but dreams are frequently much more complex, and generally the more complex, the more incoherent and inconsistent they become. The dream may consist of a grotesque assemblage of misshapen images and extravagant ideas, and of the most whimsical and foolish acts : yet all will appear to the dreamer as right, and it is only after we awake that we laugh at the ideal medley. If we were to think during the day as we dream at night, we would be fit for a madhouse ; yet these different states of the mental operations are solely owing to different conditions of the brain. If the brain was in the same state during a dream as when awake, we would dream rationally and coherently. But as this

is obviously not the case, we must come to the conclusion that at these two periods the state or condition of the organ is different. If the brain were a single organ, it is quite clear that we could never dream ; for if the organ were asleep there would be total unconsciousness, and if awake our ideas would be rational and connected ; but admit the existence of a plurality of cerebral organs and the difficulty vanishes. We could then suppose one or more of such organs awake, while the rest were asleep, and the waking organs executing their functions while the others were in a state of torpidity or repose, and we would thus have ideas and feelings corresponding with the functions of the waking organs. Every dream and every modification of dream may, on this principle, be accounted for ; and we can explain this curious mental phenomenon satisfactorily on no other.

From *reasoning,* then, we conclude that the brain is not a single organ, but a congeries of organs, through which *various* powers are manifested.

This conclusion is still farther supported by the effects of certain injuries and diseases of the brain upon the mental powers. Many cases of this kind could be adduced, but the following it is presumed will suffice.

1st. Injuries affecting the Brain.

Dr. Beattie refers to the case of a scholar who, after receiving a blow upon his head, forgot all his Greek, while his memory was strong on other subjects.

Dr. Abercrombie relates the case of a person who lost for several days, by a similar accident, all remembrance of his having a wife and children although he

recollected the accident, and his memory seemed to be otherwise perfect.

Sir Astley relates also the case of a patient, at St. Thomas' Hospital, who, after an injury of the head, was found talking in a language which none could understand, till a Welsh woman, who entered the hospital, recognised it as Welsh.

Dr. Conolly relates a still more remarkable case of a young clergyman, who, a few days before his intended marriage, met with a serious injury of the head. He recovered his health perfectly, and lived to the advanced age of eighty. But from the time of the injury his intellect was entirely perverted. Though he retained the recollection of his approaching marriage, he talked of nothing else during the period of his life, and manifested anxiety and impatience for the arrival of the happy day.

Dr. Rush refers to the case of an Italian, who was perfectly master of the Italian, French and English languages, and who, during a fever which terminated his life, in New York, spoke English at the commencement of the disease, French only in the middle, and Italian only on the day of his death.

2d. Diseases affecting the Brain.

Sir A. Cooper, in his Lectures on Surgery, relates the case of a German who laboured under disease of the brain. At the commencement of the disease the German, he says, spoke English, but as the disease advanced, the patient forgot his English, and spoke only German.

Cases occur every day of persons forgetting the

names of things, while they retain the most vivid recollection of the *things* themselves. A case of this kind is related by Dr. Gregory. The lady had an attack of apoplexy ; during her convalescence it was remarked, the memory for things returned long before the memory for words. She learned to recognise the objects that surrounded her long before she could name them, or understand the meaning of their names.

Dr. Brigham states, that he had a patient whose memory was good with respect to every thing but *places :* the patient recollected perfectly names, events, &c., but did not recollect his own or his neighbours' houses, or the place in which he had resided for many years.—(*Influence of Mental Cultivation on Health*, p. 20.)

The author of this little work was acquainted with a gentleman who laboured for some months under an affection of the brain, accompanied with partial paralysis of one side of the face, and who occasionally forgot *portions* of words. If he intended to use, for example, the word *circumstance*, he could pronounce and write the three first letters *cir*, but the rest of the word was in his mind a perfect blank ; he could for the time neither spell nor pronounce it. Whilst, in this mental state, he usually experienced darting pains deep in the orbit over the eyeballs.

7th. *Anatomy* leads to the conclusion of a plurality of cerebral organs. Although Anatomy and Physiology are intimately connected, and reciprocally assist each other, yet, it must be remembered, that Physiology is capable of shedding a much stronger and clearer

light upon the structure, than the structure upon the function; and in many organs the intimate structure cannot be learned till the uses are ascertained. Besides the investigation of structure, there are two modes which physiologists usually employ in the investigation of function. One by experiment on the living subject, torturing and forcing, as it were, nature to yield her secrets; and the other by a careful notification of the effects of diseased structure upon the function.

These are the plans indeed which physiologists generally adopt in investigating the functions of any organ; and they are the only means in the majority of cases which can be resorted to with any rational prospect of success.

Of these two methods, the latter is generally more to be depended upon than the former, and the former is more applicable to organs of a simple structure than those which are complicated.

The functions of the brain have been attempted to be elucidated in both of these ways; but only with partial success. The experimental method has led to inconsistencies and contradictions, and the observations and investigations of pathologists to no decided result. Indeed it is exceedingly probable, that neither of these modes of investigating function is applicable to the brain, for from the very constitution and structure of the cerebral mass a part can scarcely be injured or affected with disease, without other parts being simultaneously or secondarily influenced.

Under these circumstances, it is a matter of congratulation, that another and more successful mode of

investigating the functions of the brain was instituted by Gall.

Dr. Gall by a series of observations made on the living human head, arrived at the conclusion that every species of feeling, emotion, and intellectual operation, not only emanates from the brain, but also that the degree of development of the different parts of the brain indicate (under certain limitations) the degree of strength of such feelings and powers. Dr. Gall maintained that the signs of our mental constitution could be seen in the living head ; and surely there is nothing unphilosophical in such an idea ; nay, the idea that such signs exist somewhere in the body is prevalent throughout society. Is not physiognomy founded upon this very principle ? and every one admits that from the form, and more particularly from the expression of the countenance, many important conclusions may be deduced regarding the state or condition of the mind. The signs of Gall and those of Lavater are no doubt different. They are both, however, corporeal signs of a mental condition, and what reason have we to think that the signs of Gall are less valuable than those of Lavater. We have no reason to think so, for the signs of Gall have a direct reference to the part of the body through which mental manifestation flows ; while those of Lavater are at best connected with parts that are only secondarily related to the mental operations. The mode of investigation thus proposed by Gall, is founded on the principle, that the size and form of the brain can be discovered during life ; and it is scarcely necessary to say that this position is consistent with the fact. The brain itself is no doubt hid from our view ; but its protecting

bony incasement is moulded upon the organ so as to indicate with an accuracy sufficient for every practical purpose, the quantum and configuration of the contained material. Here then is the first point of connexion that subsists between Anatomy and Phrenology, and so far they unquestionably harmonize.

An important connexion subsists, in the second place, between the structure of the brain itself and the phrenological system. Phrenology inculcates that the mind displays a multiplicity of powers ; and as it is a fundamental principle in the science that the mind can be manifested only through an organic apparatus, we legitimately conclude, that a multiplicity of powers requires for their manifestation a corresponding number of organic parts ; but reasoning alone on such a subject is insufficient to convince. The question recurs : are these organic parts to be found ? If such parts cannot be demonstrated, their existence is not to be assumed ; but fortunately for Phrenology they can be easily demonstrated. The brain is the most complicated organic structure found in man ; and the most cursory glance at the arrangement of its parts leads at once to a conclusion at variance with *singleness* of structure. Without referring to the immense size of the organ in man, compared with that of other animals, we have only to observe the first grand division of the mass into cerebrum and cerebellum, or great and little brain—the division of each of these into two nearly equal and symmetrical portions—the division again of each half of the cerebrum into three lobes, the anterior, middle, and posterior, and the still more minute division of each of these lobes into numerous convolutions. All these

parts thus separated to a greater or less extent, are observed on the most cursory examination; and when we enter upon a more minute investigation of its internal structure, we find every thing harmonizing most beautifully with the principles of Phrenology—the brain is formed essentially of soft and plastic *fibres*, which diverge from the medulla oblongata, or top of the spinal marrow, to the convolutions. Here then we have undoubtedly a plurality of parts, and what reason have we to suppose that these parts are incapable of separate, and to a certain extent independent functions. The fibrous structure of the brain is directly and beautifully in harmony with Phrenology, for we have in such a structure all the necessary elements of a plurality of organs; the fibres are not only exceedingly numerous, but they vary in length, direction, and consistency. We cannot tell how these fibres are connected in the process of thinking; but knowing as we do, that mental manifestation cannot be evinced without them, it would be absurd to suppose that circumstances which affect these fibres, such as length, direction, and number, would have no effect upon the mental state.

The muscular system furnishes us with a strong analogical argument in favour of this view. Analogies are not always to be trusted, but in such a subject we have no other mode of illustration, and a corroboration of our views from other departments of anatomy, is not to be despised. The muscular system of the human body consists essentially of fibres of a particular kind, that are endowed with a property of contracting or shortening themselves; and we see that length, direction, and relative situation of these fibres,

tell materially upon the effects they are capable of producing. Influenced by these circumstances, what diversified and even opposite effects appear! Modified by these circumstances, muscular fibres may produce flexion, extension, adduction, abduction, rotation, and circumduction, of a limb. These are no doubt various and opposite effects produced by the action of similar muscular fibres : have we not good reason to suppose then, that the fibres through which mental manifestation emanates, may by difference of length, direction, or situation, be so affected as to conduce to most important differences of mental constitution and state?

The places assigned by Gall to the respective organs, both absolutely and relatively in the brain, is not only an indirect proof of the plurality of the cerebral organs, but of the truth and beauty of Phrenology as a science. It is to be remembered that Gall did not manufacture a theory ; he proceeded upon the Baconian system of observing and noting facts ; he compared the developments of particular parts of the head with the characters of individuals as displayed in their actions ; and he arrived at the conclusion, that particular conformations of head were always concomitant with particular talents or particularity of mental powers. We do not at present speak of the accuracy of these observations ; we merely wish to state that a fact was noted at one time regarding the forehead, at another time regarding the hindhead, and at a third time regarding some other region of the brain ; there was no preconceived order or system in the observations he made. These observations depended upon circumstances which were contingent, and yet what system of the mind

exists in which order and beauty are more conspicuous! Without adverting to Phrenology as a metaphysical system independently of the organs, does it not impart a strong probability of the truth of Phrenology, that notwithstanding the erratic mode in which the organs were discovered, we find no unnatural mixture or jumbling of the organs; those of the same kind are in general found in juxta-position, or in other words, we find them allocated in the most scientific and systematic manner? While we find, for example, all the intellectual powers in the *forehead*, the sentiments are found exclusively in the *upper region* of the head, and the propensities in the *lateral*, *lower*, and *posterior* regions only. Had the organs been fabricated, the method of investigation pursued by Gall would have led to a chaos of confusion, but as order and harmony reign not only in the great subdivisions, but also in the subordinate groupes of the different organs, we may safely conclude that such organs are not factitious but founded in nature.

CHAPTER III.

Comparative Anatomy of the Nervous System favourable to Phrenology.—Microscopic Animals.—Radiated Animals.—Molluscous Animals.—Articulated Animals.—Fishes.—Reptiles.—Birds.—Quadrupeds.—Argument from the Process of Development of the Brain.

The phrenological doctrine receives strong countenance and support from comparative anatomy. It has long ago been remarked, that as animals rise in

the scale of intelligence, their brain becomes the more developed. This is strikingly displayed in the vertebrated animals, but not confined to them. A short reference to the nervous system of both the invertebrated and vertebrated animals will place the subject in a clearer light. Mr. Lawrence* has remarked, that the visible fabric of the brain differs most widely in quadrupeds, birds, fishes, insects ; and that there is an equal difference in their intellectual phenomena, appetites, and instincts,—every variation in construction being accompanied, he says, with a corresponding modification of function. This is the phrenological doctrine ; and that the subject may be clearly understood, we shall give a brief outline of the comparative anatomy of the nervous system.

It has often occurred to us, that the principles of Phrenology might receive some very useful elucidations, from researches into the nervous system of the lower animals. If we except Vimont, who has confined his attention chiefly to vertebrated animals, no Phrenologist has deemed the subject worthy of special consideration. The subject is undoubtedly surrounded with difficulties—difficulties which are increased by our ignorance, of the true habitudes of many of these animals, and in some instances by the extreme delicacy of the necessary anatomical investigations. At the same time, wherever there is animal life, there is a nervous system, and in tracing this system from its simplest state, as found in the lowest animals, to the full development as existing in man, we obtain a splen-

* See his Lectures on Comparative Anatomy, p. 109.

did demonstration of a series of facts, that lie at the foundation of Phrenology.

Zoological Classification.—The first Systematic Classification of animals, was given by Linnæus in 1735. He arranged all animals into the following six classes. 1st, Mammalia ; 2d, Aves ; 3d, Amphibia ; 4th, Pisces ; 5th, Insecta ; 6th, Vermes.

In 1795, Cuvier ably pointed out the defects of this arrangement, in his memoir on animals with white blood, and three years afterwards proposed an arrangement of his own, which has been generally adopted by succeeding naturalists. The following is an outline of his arrangement. He conceives that there are four general or principal forms, into which all animals may be arranged, these he denominates, 1st, Vertebrata ; 2d, Mollusca ; 3d, Articulata ; 4th, Radiata or Zoophyta.

1st Form.—*Vertebrata.*

Classes.	Examples.
1. Mammalia.	Man. Whale.
2. Aves.	Eagle. Duck.
3. Reptilia.	Tortoise. Frog. Serpent.
4. Pisces.	Salmon. Eel.

2d Form.—*Mollusca.*

Classes.	Examples.
1. Cephalopoda.	Nautilus. Sepia.
2. Pteropoda.	Clio.
3. Gasteropoda.	Snail. Limpet.
4. Acephala.	Oyster.
5. Brachiopoda.	Lingula.
6. Cirrhopoda.	Barnacle.

3d Form.—*Articulata.*

Classes.	Examples.
1. Annelida.	Leech. Earth-worm.
2. Crustacea.	Lobster. Crab.
3. Arachnida.	Spider.
4. Insecta.	Bee. Beetle.

4th Form.—*Radiata or Zoophyta.*

Classes.	Examples.
1. Echinodermata.	Star-fish.
2. Intestinalia.	Tape-worm.
3. Acalepha.	Actinia.
4. Polypi.	Sponge. Coral.
5. Infusoria.	Monas.

Various modifications of this arrangement have been made, the latest and most important, is that proposed by Dr. Grant, who retains the primary divisions of Cuvier, but changes the number, the position, and many of the names of the Classes. The following tabular view will impart some idea of his arrangement.

1*st Division.*—Spino-Cerebrata or Vertebrata.

1. Mammalia.
2. Aves.
3. Reptilia.
4. Amphibia, (different from Cuvier.)
5. Pisces.

2*d Division.*—Cyclo-gangliata or Mollusca.

6. Cephalopoda.
7. Pteropoda.
8. Gasteropoda.
9. Conchifera. } (different from Cuvier.)
10. Tunicata. }

3d *Division.*—Diplo-neura or Articulata.

11. Crustacea.
12. Arachnida.
13. Insecta.
14. Myriopoda, (different from Cuvier.)
15. Annelida.
16. Cirrhopoda, (Cuvier places this among Mollusca.)
17. Rotifera. } (different from Cuvier.)
18. Entozoa. }

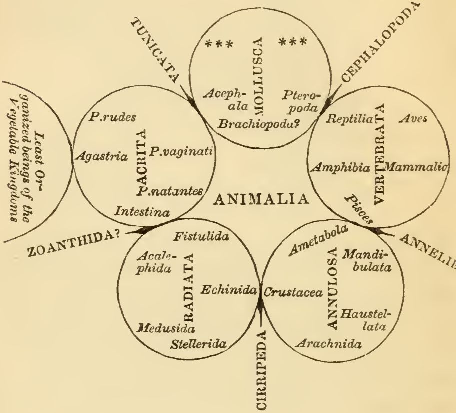
4*th Division.*—Cyclo-neura or Radiata.

19. Echinoderma.
20. Acalepha.
21. Polypiphera. } (different from Cuvier.)
22. Poriphera. }
23. Polygastrica. }

Dr. Virey, a French physician and naturalist, first assumed the nervous system, as the basis of his classification, (*Dict. Nouveau d'Histoire Naturelle*). Cuvier followed out the same principle, (*Anatomie Comparée*). Carus also classes animals according to the state of development of this system, and arranges them in circular groups (*Anatomie Comparée*), a plan which has been likewise followed by Macleay, (*Horæ Entomologicæ*,) who considers that all natural groups, whether kingdoms, or any subdivisions of them, return into themselves; a distribution which he expresses by circles, each circle being formed precisely, he says, of five groups; larger groups being connected by the intervention of lesser groups, which he denominates osculant.

Although we cannot help thinking that in this last classification, imagination prevails to a certain extent over sober observation, still the system is ingenious, and according to Kirby and Spence, nearly approxi-

mates to what we see in nature. The following diagram will enable the reader to form some idea of the primary divisions of this system



Carus supposes all animals may be arranged in three grand circles.

In the first he includes animals which he calls Oozoaires, or *animal eggs.*

In the second circle he includes animals which he denominates Corpozoaires, or *animal trunks,* and which comprehends, 1st. the Gastrozoaires, or *animal abdomens,* and secondly, the Thoracozoaires, or *animal chests.*

In the third circle he includes his Cephalozoaires or *animal heads,* which comprehends the four following

divisions: 1st, his Aedoio-Cephalozoaires, or fishes—2d, Cephalo-gastrozoaires or reptiles—3d, Cephalo-thoracozoaires, or birds—and 4th, Cephalo-cephalozoaires, or mammiferous animals.

The nearest approach to a phrenological classification of animals, is that of Lamarck, who arranges all animals into three grand divisions. The first or lowest of which comprehends animals viewed by him as *apathic* or automatic. The second, animals which he denominates *sensitive:* and the third or highest the *intelligent.*

Whilst referring to the nervous system of the inferior animals, we shall follow the arrangement and nomenclature of Cuvier, as modified by Grant, not that we consider it more correct or philosophic than that of Carus, but because it is better known, and sufficiently accurate for every useful purpose.

In the lowest group of animals, that denominated *Acrita* by Macleay, including the Polygastric, Poriferous, Polypiferous, and probably the Acalephous classes of animals, the nervous system consists of nervous globules or molecules, diffused through the cellular gelatinous tissue, of which the greatest part of their system is composed. Many of these animals appear as punctiform homogeneous substances, others are of considerable size, but all seem sensible to touch, and even to the action of light, when exposed to its influence.

In rising into the next *group*, the *Radiata*, or Radiated animals, including the class *Echinodermata*, the nervous globules are arranged in a linear manner, so as to constitute nervous filaments (nerves), and it is interesting to observe the course which these

filaments take, and the arrangement they assume. There is first, generally, a central point from which a filament or filaments pass off in the form of a ray or rays. The central point is a ganglion, and the filamentous ray is a nerve of this ganglion; usually more than one ganglion are developed connected together by threads of communication. These ganglia are situated at equal distances, and their number and arrangement are determined by the general organization and form of the animal. In the *asterias* or star-fish, with five rays, there are five ganglia so united by nervous threads as to form a ring.

In the next group, that of the Mollusca, the nervous system rises gradually in complexity, from the Tunicata or naked acephalous Mollusca of Cuvier, through the Conchifera, Gasteropoda, Pteropoda, to the Cephalopoda, in which of all these animals the nervous system is most developed.

Articulata.—The *Articulata*, or Articulated animals, are remarkable for their ring-like structure, the number of rings being determinate, and each segment a repetition of the other. Of these segments, the most anterior acquires the greatest development and constitutes the head.—The nervous system of these animals consists of series of nervous ganglia, connected by longitudinal nervous internodes. Each nervous ring is formed of a ganglion and two semicircular nerves. The rings are open with one exception, and vary in development in the different genera. In the cephalic segment a supra-œsophageal ganglion is always developed, which is the rudiment of a brain.

In the *Insecta*, or Insect tribes, the highest division

of this class, the nervous system has attained a high degree of organization and development.

It consists, *first*, of a ganglionic cord, stretching along the abdominal surface of the insect, as in most of the preceding classes.

Secondly.—Of a nervous collar that surrounds the œsophagus.

Thirdly.—Of a supra-œsophageal mass or brain, in some species much developed, and transmitting 8 pairs of nerves and two single ones.

Fourthly.—A motor tract has lately been found running along the dorsal surface of the cord, and transmitting lateral nervous branches.

Fifthly.—A vestige has also been discovered of the par vagum and respiratory system of nerves. These parts are not found in all the genera and species of insects, for we find an increase of development from the Hemiptera, through the Orthoptera, Coleoptera, to the Hymenoptera, in which, of all the insect tribes, the nervous system is most complicated.

The *development* of the nervous system in some insects is peculiarly interesting. The observations of Dr. Herold have thrown much light on this part of physiology, and which lead to conclusions favourable to Phrenology. With great care he traced the gradual changes that take place in the nervous system of the common cabbage butterfly, from the time it obtains its full size to its assumption of the *imago*. These changes were found to consist principally in the progressive shortening of the nervous internodes, and consequent approximation of the ganglia—in the obliteration of some of the nerves—in the amalgamation of two or

more ganglia—in the union of the first ganglion with the brain—in the union of two ganglia at the expense of one or two others—and lastly, in the lobes of the brain which formed an angle with each other becoming horizontal. These are, no doubt, remarkable and necessary changes ; and why necessary ? Because the animal is about to change its character, and a corresponding change of nervous system is indispensable. Had the nervous system of the insect undergone no change, when such an obvious change in the powers and habitudes of the animal had been effected, we might have drawn a conclusion unfavourable to Phrenology. But all these changes are in harmony with the phrenological system. Change of structure must always precede a change of function ; and we find here a series of important changes, without which the necessary muscular, sensitive, and instinctive powers could not have been imparted.

There is apparently a broad line of demarcation between the nervous system of the highest invertebrated, and that of the lowest of the vertebrated tribes, still there is only a higher development, and a somewhat different arrangement of parts, essentially the same. In many of the invertebrata we find nerves, ganglia, nervous internodes, and rudiments of brain.

In the vertebrata these parts all exist. The nervous internodes are made continuous by the displacement of the ganglia to the sides, and the columns of nervous matter thus formed, constitute by their enlargement a spinal cord—the *nervous collar* that encircles the œsophagus, and stretches to the brain is by increase of size, converted into the medulla oblongata, or top of

the spinal cord, and the brain which is extremely rudimentary, becomes massy and complicated, yet not equally developed in all the classes. It is least developed in fishes, more so in reptiles, still more in birds, and attains still higher degrees of complication in mammiferous animals.—All naturalists admit that fishes rank lowest in the scale of vertebrated animals—that reptiles are somewhat more elevated, or display instincts of a higher character—that the instincts of birds are of a loftier kind than those of reptiles—and that mammiferous animals approach many of them in sagacity to human reason itself. Let us trace then briefly the state and comparative development of the nervous system of vertebrated animals.

Of *Fishes.*—As might be expected, the nervous system of these animals varies greatly, both in form and development; but the distinguishing peculiarity in them all is great development of spinal cord, and little development of brain.

The brain of fishes is extremely small, and fills only a part of the cranial cavity. Its absolute size, and proportion to the size of the body, varies in different kinds of fishes; but in all, the size whether absolute or relative, is in a minimum state.

The class *Reptilia,* or reptiles of Cuvier, includes the *Amphibia* and *true reptiles* of many modern naturalists, the Amphibia corresponding with the Batrachian or frog-like animals of Cuvier, and the true reptiles, including the Ophidian, or serpent kinds, the Saurian, or lizard tribes, and the Chelonian, or turtle families of the great naturalist.

These animals have so great a similarity of nervous

system, that we may with no impropriety, group them together, and they are admitted to stand higher in the *scale* of being than fishes.

The brain in reptiles, although small, fills completely the cranial cavity, but, owing to the peculiar form of the cranium, rarely corresponds with the size or form of the whole head. Phrenology, then, could not be applied practically either to fishes or to reptiles. The brain of reptiles is otherwise consistent with phrenological doctrine. 1st, It is more developed relatively to the spinal cord, and absolutely in itself, than the brain of fishes. 2dly, The cerebral lobes are all relatively larger than the other parts of the brain. And, 3dly, The form of these lobes differs sensibly with the inherent dispositions of the animals.

The posterior cerebral mass or cerebellum, in all reptiles is extremely small, and varies somewhat in form in different genera. In the frog, it is a thin transverse band. In the viper and lizard, the band is of the same form, but its thickness has attained a considerable increase ; and in the turtle, it is tongue-shaped, and presents extremely minute lateral appendages, which are also formed in the crocodile.

Aves.—From the nervous system of *Reptiles*, we rise insensibly to that of *Birds*, in which all the parts of this system, and particularly the brain, have attained a higher development. This superior development may be deduced, 1st, From the greater proportion it bears in weight, to that of the whole body. 2dly, From the superior weight of the brain over the spinal cord. 3dly, From the altered relative position of the parts contained within the cranium ; and 4thly, From the more complicated

state of some of these parts. In a pigeon, which according to Carus, weighed 3360 grs., the brain weighed 37 grains, and consequently bore the proportion of 1 to about 91 ; and in small birds the proportion is higher —as high even as 1 to 20 or 25.

The brain in birds fills completely the cranial cavity, so that the scull is a measure of the size, and indicates accurately the configuration of the parts within. These parts consist of the cerebral hemispheres—the optic lobes, and the cerebellum, as in fishes ; but the *relative* size of these parts is now greatly changed, the cerebral mass being not only relatively much longer than in the inferior classes, but the cerebral placed also more *above* the others: an approximation to the state of things as existing in man. The form of this part of the brain too, is not the same in all birds, Mr. Anderson* found it in the sea-gull and snipe, oblong and largest posteriorly : in the hawk, more round and short : in the goldfinch and pigeon, more elongated backwards, and covering the optic lobes. The *hemispheres* in birds are united by an *anterior commissure*, above which the first rudiments of a *corpus callosum* appears. The lateral ventricles are now formed, and corpora striata and optic thalami discoverable. The olfactory nerves are hollow, and communicate with the lateral ventricles.

The optic lobes are small, and more widely separated than in fishes and reptiles. They present the same form in all birds, and are hollow, but the walls of the

* Medical Gazette.

cavity are thicker and altogether more solid than in the lower classes.

The *cerebellum* has now attained a high degree of development. It consists of a single median lobe, and small lateral appendages, it is traversed externally by grooves or furrows, and internally presents now some traces of the *arbor vitæ*.

Mammalia.—From the nervous system of birds, we rise by an easy ascent to that of mammiferous animals, and amongst the general similarity of nervous constitution which appertains to all the individuals of this class, we observe gradations of this system, both of size and form, both of structure and internal organization;—gradations that rise imperceptibly, till we reach that measure of development that constitutes the sum of animal perfection, as concentrated in man.

The most striking peculiarity of nervous constitution in the mammalia, is the great predominancy of the *brain* over the other divisions of the central axis of the nervous system, arising chiefly from a great development of the cerebrum and cerebellum.

The cerebellum in mammiferous animals has attained a very great development. It not only consists in all of a median and two lateral lobes, but the lateral lobes in the greatest number of these animals constitutes the largest portion of the mass. In all, it is more or less furrowed externally, but the number, the length, and depth of the furrows vary in different animals, and correspond with the status of the animal in the scale of existence. The lower the animal in the scale, the cerebellum is the smoother, and as the animal rises in the scale, the furrows become more numerous, longer, and

penetrate deeper into the substance of the organ. In the bat, the cerebellum is nearly smooth, and the lateral appendages very small. In the horse, the lateral appendages are deeply furrowed and lobulated, and in the ape, it has a most striking resemblance to the same part in man. The high development of the cerebellum is farther displayed by the existence of the *arbor vitæ,* and fourth ventricle:—a chamber or cell which is formed by the divergence of the corpora restiformia, and which is open in the inferior classes of animals, but covered over in mammiferous animals by the development of the cerebellum.

The *cerebrum*, or brain proper, in mammiferous animals is more highly developed than any other division of the nervous system, yet it is not developed to the same degree in all animals of this class. In some it is small, smooth, or unconvoluted, and rudimentary as in the ornithorynchus and marsupial animals ; in others it is large, and the convolutions upon its surface strongly marked.

In some the cerebrum is so small that it reaches only as far back as the *optic lobes*. In others, it projects so as to cover these bodies, and in others it extends backwards still farther so as to cover the cerebellum in part or wholly. In the bat, the tubercula quadrigemina are quite exposed. In the sheep, the tubercula quadrigemina are covered, but the cerebrum extends no farther than the anterior margin of the cerebellum. In the horse, from the great development of the cerebrum backwards, the cerebellum itself is in *part* covered. In the monkey, the cerebellum is completely covered by the cerebrum, and in man, the cerebrum is deve-

loped so far in the same direction, as not only to cover the cerebellum, but to project often an inch beyond it altogether. In man, and the ape tribes, then, the cerebellum is situated entirely under the posterior part of the cerebrum.

The cerebrum is not only found in various degrees of development, but its form is different, in different mammiferous animals. It is well-known that the brains of carnivorous animals are widest betwixt the ears, and in graminivorous animals, that part is the narrowest. In the bat, the length and breadth of the cerebrum are equal. In the rat and mouse, the form is oblong-ovate much narrowed anteriorly. In the sheep and deer more oval. In the horse, the form is oblong square, the angles rounded off anteriorly and posteriorly, and the anterior lobes large. Indeed in every genus of animals there is a peculiarity of form, and even in animals of the same genus and species, there are shades of difference that the critical eye can easily discover.

Here then we have varieties, *ad infinitum*, of cerebral organization and state—varieties in development, even in the *number* of the parts themselves—varieties in the *size* of these parts, and varieties in the form both of the smaller subdivisions of the brain, and of the *whole* cerebral mass.*

* In the larger mammalia, the cat, polecat, marten, fox, dog, ape, the convolutions are more distinct and numerous, but their form varies according to the species.

" In the dolphin, elephant, and man, they are more numerous and deep than in the beaver, kangaroo, and cat, and their form and direction varies essentially with the species.

" In all the mammalia, the cerebellum possesses, besides the middle or fundamental part, two lateral parts which are more or less complex according to the species.

In the vertebrated animals the nervous system is exceedingly complicated, but its *outlines* are the same in fishes, reptiles, birds, and quadrupeds. These animals have all the grand divisions of the nervous system as in man, but their brain differs most remarkably from that of man in size, form, and complexity.

The brain in fishes is in a mere rudimentary state, more developed in reptiles, still more in birds, and in quadrupeds it has attained an approximation to the human brain.

In determining the degree of development of the cerebrum, the following circumstances require to be attended to :—

1st. The *relative size* of the cerebrum to the spinal cord and optic lobes of the same brain.

2d. The relative *situation* of the cerebrum to the optic lobes and cerebellum.

3d. The state of the exterior of the cerebrum in regard to smoothness, or the existence or non-existence of convolutions, and,

4th. The state of the interior of the cerebrum in regard to its commissures.

"The number of the integral parts, or of the convolutions of the brain, varies also in the different *species* of the mammalia ; in some the anterior lobes of the hemispheres are larger or more elevated ; in others again, the inferior parts of the anterior lobes are nearly wanting. The middle lobes and the other convolutions present similar varieties.

"In this way the integrant parts of the brain augment in number and development as we pass from a less perfect to a more perfect animal, till we arrive at the brain of man, who, in the anterior and superior region of the frontal bone, possesses several parts of which other animals are deprived, and by means of which he is endowed with the most eminent qualities and faculties, with reason, and the feeling of religion, and the existence of God."—*Gall*, Vol. ii. p. 364.

Absolute size is not a measure of development among the brains of different animals, because the brain must bear a certain relationship to the size of the body in all classes of animals, and consequently a very large animal of a lower class will necessarily have a larger brain than a very small animal of a higher class. For example, the brain of a large shark is very small compared with the size of the animal, but it is much larger absolutely than the brain of a mouse, which though absolutely small, presents evidences of a higher development than the other. We cannot, then, from the mere size or weight of the brain in any given case, arrive at a just conclusion regarding the state of development of the organ. Among animals of the same kind, after the medium size of their brain is known, the absolute size may lead to conclusions regarding the weakness or strength of their cerebral power, but no conclusion can be drawn from absolute size alone, regarding the instinctive or mental capacities of any animal.

The *relative* size of the brain to that of the whole body of the animal, will not even indicate accurately the degree of the cerebral development although it is more to be depended upon than *absolute* size. In general, as animals rise in the scale, their brains not only become more complex, but larger in proportion to the size of the whole body. But although this is a fact applicable to the great majority of animals, still the exceptions are numerous, and the laws of nature have no exceptions. The brain of the canary, and many other birds, constitutes a 25th part of their whole weight, whereas, the brain of the elephant in every respect more fully developed than that of birds, does not

weigh a thousandth part of the huge body of the animal. The relative size of the brain then to the whole body, cannot be viewed as a test or measure of cerebral development.

The relative size of the brain to certain parts of the nervous system, and in particular to the spinal cord, will lead to more accurate results regarding cerebral development. In fishes, as we have seen, the spinal cord is absolutely larger than the brain. In reptiles, this is also the fact, but to a less degree. In birds, the spinal cord is smaller than the brain, and in mammiferous animals, the spinal cord is relatively so small, that it appears as a mere appendage to the encephalic mass. In fishes, the proportion of brain to spinal cord has been found as 100 : 750. In reptiles, as 100 : 180. In birds, as 100 : 30. And in mammiferous animals, as 100 : 22. These proportions do not hold good in all animals of their respective classes. Those animals that are lowest in the scale of each class, have the spinal cord relatively largest; and those highest in the class, relatively smallest. This may be rendered plainer by referring to the proportions in mammiferous animals. We have said that the proportion of the brain to the spinal marrow in these animals, is as 100 to 22. These are the proportions found in the mouse, but mammiferous animals lower in the scale, than the mouse have the relative proportion of their spinal cord larger than the above statement indicates, and all animals higher in the scale than the mouse, have the cord relatively smaller. Man has the smallest spinal cord compared with the size of the brain, and we know that the brain

of man is in a higher state of development than that of any other animal.

The degree of the development of the brain may be known with more certainty, from the *relative position* of its principal parts, than from its relative size. In ascending from fishes through reptiles and birds to mammiferous animals, the three grand divisions of the brain, the cerebrum, optic lobes, and cerebellum are found gradually to change from a horizontal to a vertical position. In the fish and reptile tribes, these three divisions of the brain are on the same plane, the cerebrum anteriorly, behind which we find the optic lobes, and still more posteriorly the cerebellum. In birds, the cerebrum is seen to be on a higher level than the optic *lobes* and *cerebellum*, and this movement of ascension increases through the various genera of mammiferous animals to man, in whom these different parts are placed, the one almost directly over the other.

The degree of development of any brain, can be still more easily and unerringly determined, from the state of its periphery, and the existence or non-existence of certain internal processes, as the commissures.

In deducing conclusions regarding cerebral development, we derive our data chiefly from two sources: first, from Comparative Anatomy, or from the examination of the brains of animals possessing various kinds and degrees of instinctive and intellectual capability; and, secondly, from the investigation of the changes that take place in the brains of the higher animals, and particularly of man, from the first appearance of the cerebral organ, at the dawning of its existence, through

the various changes it undergoes, till it has attained full growth, or its full measure of development. In fishes, reptiles, and birds, the periphery of the brain is uniformly smooth, and in the greatest number of mammiferous animals more or less convoluted, but the depth of the convolutions varies in different animals. In the lowest of mammiferous animals, as the duck-billed quadruped, the bat, and some others, the brain is nearly as smooth as that of birds, and as we rise in the scale the convolutions become more and more prominent and the intervening furrows more and more deep, till we reach that extraordinary development of the convolutions found in the human brain. The smoother the brain, then, the less developed it is, and the more convoluted the more fully developed. This conclusion is strongly corroborated, by the history of the progressive growth and development of the human brain. It is well known, that till the fifth month of utero-gestation, the brain of the human fœtus is perfectly smooth, at the sixth month the convolutions are confined to a certain part of the hemispheres ; and during the seventh, eighth, and ninth months, the convolutions become more and more numerous, and increase gradually also in convexity or prominence.

The condition of the *commissures* indicates also pretty accurately the degree of cerebral development. In fishes, reptiles, and birds, the anterior commissure only can be said to exist. In all mammiferous animals there are 3 grand commissures—the anterior, posterior, and superior or corpus callosum, which last varies in relative size in different animals of this class. It is extremely small in those lowest in the scale, and as

animals ascend in the scale it becomes larger or extends farther back, and connects consequently more of the opposite hemispheres. That the state of these commissures can indicate, to a great extent, development of the whole brain is demonstrable from two important facts : 1st, The late period in the formation of the brain at which they appear ; and 2dly, The progressive changes that take place in the superior commissure during the process of its evolution. The commissures are formed by the converging fibres of the brain shooting from the opposite hemispheres, and uniting in the mesial line of the cerebral mass. At the earlier periods of embryotic life, the cerebrum consists of two lateral portions or hemispheres, not connected by transverse bands, and when these bands or commissures appear, the two lower are always developed before the upper, and the development of the superior one commences anteriorly and the more development it has acquired, it extends relatively the farther back—connects more of the opposite hemispheres, and closes in more of the lateral ventricles. The brain then in which the anterior and posterior commissures only are found, is in a low state of development, and when three commissures exist, and the corpus callosum large, the brain so circumstanced is in a high state of development.

The fish is lowest in the scale of vertebrated animals, and it possesses, as we have hinted, a brain of the simplest form. Reptiles rank higher in the scale of being than fishes, and have a greater development of the cerebral organ. Birds have propensities and powers which are not found in the reptile tribes, and have a corresponding increase in their brain. Quadrupeds are

admitted to be far superior to birds in those instincts which approximate to human reason, and in them we find a cerebral form and development which we look for in vain in the less exalted classes. In all the inferior animals, the cerebral lobes are in a rudimentary state, or at best, developed in a slight degree; but in man they are at a maximum of development, and, it is needless to say, that in him the intellectual powers are in corresponding pre-eminency. From these facts we are entitled to draw the conclusion, that the brain is not a single organ ;—that different parts of it have different powers ; for when certain parts are small or defective, certain powers are weak or non-existent, and with the development of the part the power appears. Besides, as man has all the parts of the brain which exist in the inferior animals, as well as many other peculiar to himself, we are led to the conclusion, that he must exhibit not only all the feelings which exist in the lower tribes, and other powers which they do not display ; but also, that those parts of the human brain which exist in the inferior animals, must be the seat of animal propensity, and those parts which exist only in man the seat of powers purely moral and intellectual. Such conclusions are neither forced nor hastily drawn. They flow purely from the facts which comparative anatomy furnishes, and form, at the same time, an adamantine basis on which phrenological science may be erected.

CHAPTER IV.

Nervous System of Man.—Nerves.—Ganglia.—Plexuses.—Spinal Marrow or Chord.—Medulla Oblongata. — Cerebellum. — Cerebrum. — Parts external to the Brain.—Heads.—Facial Angle.

THE *Nervous System* of Man is remarkably complicated, yet a short description of the different parts that enter into its formation may not prove uninteresting even to the general inquirer. All the parts of this system may be classified in the following manner :—1st. Some of these parts are arranged into *cords* called *nerves*, which ramify or branch into all the textures of the body. 2d. Others are collected into knots termed *ganglia*, which differ in form, size, consistency, and colour. 3d. Others are aggregated into masses, as in the brain and spinal cord. The nervous cords or *nerves* are seen frequently to unite, separate, and unite again, so as to form intricate net-works called *plexuses* and from these, nerves are seen to run off to supply organs at a distance. Even *ganglia* and *plexuses* intermix and form a still more intricate assemblage of parts. It is exceedingly difficult to discover the *uses* of all the individual parts of the nervous system. At the same time, we should endeavour to ascertain their use. It is, indeed, of some moment, that we can distinguish nervous matter of vegetative from that of phrenic life; but this is not enough : our energies should be directed to discover the uses of *all* the parts of the nervous system. The subject is of the deepest interest; but it can only receive at present, a very general consideration. And,

First.—Of the cords we usually denominate nerves.—Nerves are cords of a white or whitish colour, the consistency and solidity of which vary in different parts of the body. They are composed of fibres which are connected by cellular membrane, and surrounded still farther by a sheath of the same texture called *neurilema*, which imparts considerable firmness to the texture, and prevents the separation of its constituent parts. The fibres can be easily seen either by slitting up the sheath which surrounds them, or by cutting a nerve across, and examining the section. The fibres are placed parallel with each other. The intimate structure of such fibres, however is not known.—Some have described them as tubular, and even pretended to have injected them, while others maintain that they are solid; some consider them so elastic as to be capable of vibrating, while others insist that they are soft and inelastic, and incapable of performing their function upon the principle of a vibratory motion. Many view them as prolongations of the brain and spinal cord, and consequently as formed of matter similar in every respect to the white cerebral substance, while others reject this view of the case and maintain that they are formed of something essentially different. We are as yet ignorant of the intimate structure of the nerves, and cannot, therefore, determine the mode in which they perform their functions. We know, indeed, that every nerve essentially consists of two parts, one exterior, protecting and containing, and which is formed of condensed cellular membrane; and a second, interior, contained or functional; but the precise character of

this indispensable part of the nerve has not yet been discovered.

These cords not only differ so far that some are engaged in vegetative and others in phrenic functions ; but amongst the nerves of phrenic life, diversities of structure and function are apparent. We find not only nerves of motion and sensation, but each of these classes has been found to present modifications of function worthy of attention. Sir Charles Bell has discovered, that, besides the motive nerves of the general system —those that place the muscles under the control of the will—there are *superadded* nerves of a similar kind which he calls *respiratory*, because they ramify upon the muscles concerned in the process of respiration, and associate and combine the muscles on which they ramify in the performance of the respiratory function.

Among the nerves of *sensation*, too, we know that some are adapted for communicating general sensibility to the skin, and all the other textures, and others for imparting powers inherent in the four special senses, those of taste, smell, hearing, and sight.

We know from *observation* and *experiment*, that nerves differ in function. The mode in which they perform their functions are hid from our view, and the observation is applicable not to the nerves only, but to all the textures by which vital and intellectual operations are performed.

Secondly.—Of the nervous Ganglia and Plexuses. The nervous swellings or enlargements called ganglia, are found in determinate situations, but they differ remarkably in form, size, and colour. As we have already hinted, they are found in connexion with the

nerves both of vegetative and phrenic life. Dr. Spurzheim says they are composed of two nervous substances, the white or fibrous, and the gelatinous or pulpy into which the white is plunged. This opinion is controverted by Serres ; and Scarpa, who has written particularly upon the structure of these bodies, describes them as consisting of a congeries of nervous threads, most of which are scarcely perceptible, and all continuous with the nerve or nerves above and below the ganglia. According to Scarpa, then, the nervous cord when it enters the one extremity of the ganglion begins to be separated into its component fibres, which diverge and form intervals, between which delicate cellular tissue is interposed, and that these filaments are subsequently collected at the opposite extremity of the ganglion, where they are continued into the other nerve or nerves. Our own experiments and observation would lead us to prefer the conclusion of Scarpa, yet the opinion of Spurzheim derives much plausibility from the fact that one or more of these ganglia takes the place of the brain in the invertebrated animals, and under these circumstances would require to be composed at least of the grey and white cerebral matter which are known to enter into the brains of the higher animals. At the same time from repeated examinations of this texture, we would be inclined to describe each ganglion to consist of the three following parts. 1st, An exterior covering which varies in thickness in the ganglia of phrenic and vegetative life ; 2d, A number of minute nervous filaments ; and 3d, A quantity of cellular tissue by

which these filaments are connected, and which constitutes the principal part of the ganglionic mass.

Various opinions have been entertained regarding the *uses* of the ganglia. Some view them as brains or centres of nervous energy; others as parts that withdraw the nerves which pass through them from the influences of the will; and others, along with Spurzheim, that they are essential parts of the nerves to which they belong, originating nervous fibres and serving as points of communication between different nerves, as well as probably aiding in the evolution and distribution of the nervous fluid, a fluid which is supposed by many to exist, although it has never yet been a subject of demonstration. The ganglia appear to us to effect two purposes, to be inlets of nutrition to the nervous filaments, and modifiers of the action of nerves. The first of these objects is effected by the extended surface, which the ganglion presents for the entrance of blood-vessels, and the second from the change of relationship which the nervous fibres experience in their transit through the ganglion, a change which may be compared to the change of relationship which takes place to a great degree in the formation of a plexus.

A *plexus* is formed by the mutual communication and subsequent separation of two or more nervous cords. The plexus is sometimes simple and formed in the manner above stated, sometimes much more complicated, when we find a greater degree of plaiting or interlacing, and generally the greater the number of cords that enter into the plexus, the crossing and interlacing is the greater. Some of the plexuses are situ-

ated at the exterior and others in the interior of the body. Some are formed by nerves of vegetative and others of phrenic life. They resemble in this respect the ganglia, and probably ganglia and plexuses differ in nothing essential. This opinion however is purely hypothetical, yet it receives some support from the fact that ganglia are found occasionally to take the place of plexuses and *vice versa;* and that one of the ganglia (the Gasserian), at the posterior root of a compound or spinal nerve always assumes the plexiform character, that it may probably accommodate itself more easily to the form of the surrounding textures. Plexuses seem chiefly useful as organs of sympathetic union, collecting the nervous fibres and cords from various organs, and thus combining these organs in sympathetic unity. What the structure and use of ganglia in the invertebrated animals may be, is not easy to determine. Analogy would lead us to the belief that the superior ganglia at least of such animals are modifications of brain, as these ganglia always enter into the formation of their heads, and differ as remarkably in form and magnitude as the instinctive powers of such creatures differ.

Thirdly.— Of the Cerebro-spinal axis. This part of the nervous system is contained within the cranium and vertebral canal, and displays great diversity of parts and complication of structure. We may divide it into four portions. 1st, The spinal marrow or cord. 2d, The medulla oblongata. 3d, The cerebellum ; and 4th, The cerebrum. The first and second of these divisions are remarkable for their external smoothness, the third for its *laminated* appearance, and the fourth for its

convoluted structure. In the spinal cord and medulla oblongata, the *grey** cerebral matter is enclosed in the *white ;* and in the cerebellum and cerebrum, the grey matter both covers the white and is plunged in various ways into its substance.

1st. *Of the Spinal Cord.*—The spinal cord is an irregular cylindrical mass that extends from the crossing of the pyramidal bodies, which is nearly opposite the foramen magnum of the occipital bone, to the inferior margin of the first lumbar vertebra, and consequently occupies only the cervical, dorsal, and a small part of the lumbar regions of the spinal canal—the remaining part of the canal being occupied by the *cauda equina*, or nerves which connect the pelvic extremities to the lower part of the cord.

We cannot wait to notice the beautiful adaptation of the spinal cord to its surrounding apparatus, or show how exquisitely the spine, its external incasement, is not only calculated to protect the nervous prolongation within, but to perform opposite and apparently inconsistent actions upon the due performance of which however, not only the well-being of the spinal cord itself, but of almost every other part of the body de-

* The central parts of the nervous system in man, and almost all vertebrated animals, consists of two very distinct kinds of nervous matter or *neurine*, as it has lately been called. The *one* grey and pulpy or unfibrous is found upon the exterior of the cerebrum and cerebellum, in the interior of the spinal cord and forming also the principal part of the internal ganglia of the brain : the *other* is white, and consists of fibres which form the largest portion of the central organs of the nervous system. The grey matter is more vascular than the white, and is supposed to be endowed with eminently exalted vital powers,

pends. We can only afford time to refer to the structure and uses of the spinal cord itself. This is the least complicated of all the parts of the *cerebro-spinal axis.* It consists of two columns of white nervous matter united together in the mesial line of the body, and inclosing a central column of grey matter of a very peculiar form. The whole mass is perfectly symmetrical, and divided by an abdominal and dorsal fissure or groove into two equal or nearly equal parts. The *lateral* longitudinal grooves referred to by Soemering and Portal we have never been able to discover. We are persuaded they do not exist and this is also the opinion of Spurzheim, and many other modern anatomists. The spinal cord is not of equal thickness throughout. Its thickness at every part bears a uniform relation to the magnitude of the nerves that proceed from it, and consequently it is thickest at the points where the nerves of the upper and lower extremities are attached. Each column of the cord has two sets of nerves inserted into it, one into its dorsal, and the other into its abdominal surface. These are usually called the dorsal and abdominal *roots* or origins of the spinal nerves; although Serres and Geoffroy St. Hillaire, have clearly demonstrated that these nerves *arise* from the various organs of the body, and are *inserted* into the spinal cord. The experiments of Bell and Magendie, have also proved that the dorsal roots or insertions, with their ganglia, are nerves of *common sensibility*, and that the anterior insertions belong to nerves of *motion* only. These facts have led many physiologists to the conclusion that the spinal cord is an organ of motion and sensation, but in

what respects it differs from the functions of the nerves inserted into it, has not till lately been explained. Dr. Spurzheim says, that it is, 1st, The *origin* of the spinal nerves ; 2d, An apparatus that contributes to muscular and sensitive powers ; and 3d, A means of communication between the cerebral operations, the sense of touch, the power of motion in general, and the functions of vegetative life collectively.

These indeed are the received opinions of Physiologists. Of late, another use has been attributed to the cord by Dr. Marshall Hall, which he calls the *reflex function*. Dr. Hall has clearly demonstrated that *motions* may be excited in muscles by stimulating nerves of *sensation*, and that such motions will take place without the intervention of sensation or volition, for these motions take place after the brain is removed, but cannot be superinduced except by the direct application of a stimulus to the *motor* nerves, after the spinal cord has been destroyed.

Spurzheim admits, with the more accurate anatomists, that each lateral half of the cord consists of a single column of nervous matter, to which both nerves of motion and sensation are attached ; he supposes the column formed by a nervous ribbon rolled upon itself ; and can easily suppose the transference of action that takes place upon the principle of Dr. Hall. The spinal cord appears besides to be an instrument of *communication* between the nerves and the brain, the seat of the intellectual operations. We could easily prove the correctness of this opinion by a reference to the effects of compressing the spinal cord—the nerves below the point of compression only being uniformly

affected, and never the nerves between the point of compression and the brain. When the spinal cord at the upper part of the neck is compressed the animal instantly dies, and we know that it dies, not so much from the *direct* effects of the lesion, as from the paralysis superinduced upon the nerves, below the point of compression, and more particularly from the paralysis of the respiratory nerves. These nerves are cut off from the influences of volition, the respiratory muscles consequently do not act, and death necessarily and immediately ensues.

2nd. *Of the Medulla Oblongata.*—The medulla oblongata is often viewed by anatomists as nothing more than the upper extremity of the spinal cord, and differing in no respect from the lower part of the prolongation, except in a slight difference of form, and a greater degree of bulging or protuberance. The medulla oblongata, however, is an organ in some respects essentially different, though in connexion with the former. It is more complicated in structure than the body of the spinal marrow, of which it may be said to constitute the capital or top. It consists of six eminences or columns of cerebral matter, three on each side; these are the *pyramidal*, *olivary*, and *restiform* bodies, by the union of which a distinct mass is formed, which lies within the cranium, and is in connexion with nerves, like the spinal cord itself, and capable besides of being traced upwards into the substance of the cerebrum and cerebellum. It seems, therefore, to have functions in common with the spinal cord, and others which cannot be said to appertain to that part of the nervous system. The medulla oblongata is

undoubtedly an organ of communication and connexion between certain nerves and the brain, and constitutes besides the formative or commencing fibres of the cerebrum and cerebellum. This last mentioned opinion is not purely hypothetical, it is derived from observation. The medulla oblongata exists before the brain ; it consists of bundles of fibres which are found to extend upwards with the development of the cerebral organ. There can be no doubt that the medulla oblongata consists of bundles of fibres ; there can be no doubt that these bundles increase in length from below upwards, and there can be no doubt that these bundles can be traced into the cerebrum and cerebellum, and that they enter into the structure of these parts. It is extremely probable, besides that the respiratory function has its seat in this part of the nervous system.

3d. *Of the Cerebellum.*—The cerebellum is situated in the lower and back part of the cranium, under the posterior lobes of the cerebrum, a dense membrane intervening to ward off the pressure of the superincumbent mass. The cerebellum is of an elliptical form, the long diameter stretching horizontally and at right angles to the mesial line of the body. Like all other parts of the nervous system, it is symmetrical, its middle line corresponding with the mesial line of the body, and dividing the whole mass into the right and left hemispheres, which have been still farther divided by some anatomists into lobes, and these lobes into laminæ. It is foreign to the present discussion to enter into a minute examination of all the processes that are found upon the external and internal surface of this division of the brain. It is sufficient at present to state that the

cerebelium consists of grey and white cerebral substance, the grey covering the exterior of the whole mass, and found also in the interior. This last constitutes the ganglion of the cerebellum, a nucleus of grey matter which is brought into view, by making a vertical incision at the junction of the internal with the two external thirds of the cerebellic hemispheres. The white or fibrous matter of the cerebellum is continued from the corpora restiformia of the medulla oblongata and meeting with the grey ganglia, it proceeds strengthened and reinforced, and enters into the formation of the laminæ. This constitutes the *diverging fibres* of the cerebellum. Another set of fibres are described by Gall and Spurzheim as arising from the laminæ, and which enter into the formation of the *pons varolii* or *tuber annulare.* These are the *converging fibres* of the cerebellum, which meet in the mesial line and form a commissure which always bears a relation to the size of the cerebellar hemispheres.

The *cerebellum* is not a simple portion of cerebral matter. It is highly complicated, and probably is the seat of more than that feeling indicated by Gall. This is a supposition which appears more than probable from the following considerations :—1st. The magnitude of the cerebellum. 2dly. The complicated character both of the external and internal structure of the part. 3dly. The successive additions made to it during its development. 4thly. The diversity of form and complication which exist in the cerebella of lower animals. And, 5thly. The fact that injuries that affect *one* part *only* of the mass, produce effects on the generative organs. There can be no doubt that

part of this organ is the seat of the instinct of propagation. What the functions of the other lobes may be we cannot tell, and it is useless to conjecture.

4th. *The Cerebrum.*—This is the largest, most complicated, and most important part of the nervous system. Occupying six-sevenths at least of the cranial cavity, it chiefly contributes to the size and form of the whole head, and deserves consequently particular consideration. Some have maintained that the form of the head is dependent upon the scull rather than upon the brain, but the most undoubted evidence exists of the erroneous nature of such a conclusion. The brain, we know, is not only formed prior to the scull, but every modification of form and size of the cerebral organ, and parts within, influence in a corresponding ratio the form and size of the osseous encasement.

The *form* of the cerebrum has been represented as nearly the same in *all brains*, but the idea is fundamentally erroneous. There is a *similarity* undoubtedly among different brains, but nothing more ; and it may be questioned if two brains have been ever found precisely alike. We find not only differences in the great outlines, some being long and narrow and others short and broad—some being large and massy in the superior region and narrow below—while in others an opposite configuration is visible, the greatest mass being at the base of the brain, and the least at the top ; but remarkable differences are also discoverable in the relative size of the anterior, middle, and posterior lobes, and in the relative size of the different convolutions. The cerebrum has indeed a form which may be said in a general way to appertain to all brains ; but the modi-

fications of that form are infinite, like the diversity of character that exists in society. The *general* form may be said to be oval when viewed from above, the smaller extremity of this oval being turned forwards. The cerebrum is divided by a deep fissure into two nearly equal and symmetrical parts, termed hemispheres, the fissure giving lodgement to a dense membrane which separates the hemispheres, and prevents the one from gravitating upon the other in the varied lateral motions of the head. The two sides of the cerebrum are united in the *centre* at different points, but at the anterior and posterior extremities they are completely separated. The superior, lateral, inferior, and commutual surfaces of both hemispheres of the cerebrum are remarkable for the number of ridges and depressions, or in other words, for the *convolutions* found on every part of the external surface of the organ. The *internal* surface is smooth and so disposed as to form cavities or chambers called *ventricles* or cells, which secrete a serous fluid; but the use of such chambers and the fluid they secrete is not known. In the ventricles, the *internal processes* of the brain are best seen; but without waiting to describe these processes, it may be stated that they are not viewed as phrenological organs. They are believed to be, some of them, *ganglia* or organs of reinforcement, and others organs of cerebral *communication* and connexion.

Gall viewed the brain as composed of two sets of fibres—the diverging and converging. The first, he says, are capable of being traced from the pyramidal and olivary bundles of the *medulla oblongata*, through the great ganglia, to the convolutions which

are principally formed by such fibres ; and the second from the grey matter upon the surface of the convolution to the mesial plane of the brain, where they form by their convergence the commissures. Whether the structure of the brain, as indicated by Gall and Spurzheim, be substantially correct is yet problematical. Some of their views have been proved to be correct; but it remains to be proved, whether others are equally well founded.

Phrenology leads us to draw conclusions from the *form* of the brain regarding the functions of the individual parts ; and these conclusions, if true, can never be affected by any subsequent discovery that may be made of the *intimate* texture of the organ. Gall's primary phrenological observations were made previous to the knowledge he ultimately arrived at, of the structure of the brain. But these observations are still admitted to be correct, and they will remain correct whatever notions we may entertain regarding the structure. Gall's phrenological conclusions were not drawn from any supposed anatomical structure. His conclusions were the result of close and accurate observations, and of observations relating entirely to the *form* of the brain. So long, then, as we can prove a relationship between the configuration of the brain and the character of the mental powers, the intimate structure, in determining the truth of this relationship, can at best be only of secondary importance.

Every part of the brain exists at the period of birth, yet at that period it is unfit for exercising its functions. It is *larger* at that period than in many of our intelligent animals, yet the mind of the infant is a perfect

blank. We are bound to believe, therefore, that the want of some quality rather than quantity of brain is the cause of this peculiarity. The brain is destitute of the necessary consistency or cohesion, and a certain consistency of fibre seems indispensable for vigorous action. In tracing the brain from birth to the period of old age, we can gain little assistance even from those who have devoted their attention to this very subject, for they have generally proceeded upon the principle that the brain is a single organ. All their observations, therefore, respect the general length, the breadth, or the average proportions of such parts as the cerebrum and cerebellum, or the proportions of the cerebrum and cerebellum to some of the internal processes. If we would exclude any from this general animadversion, it would be the Wenzels. For twelve years they were engaged, and under most favourable circumstances, in investigating the structure of the brain, and they have given the result of their experience in a book remarkable for minute and elaborate detail.* The general result of their investigations is, that some parts of the brain increase most in size before birth, others between birth and the seventh year, but that all the parts of the cerebral organ have acquired, at the seventh year, their full dimensions, and suffer no alteration in this respect afterwards.

These facts, founded as they are on accurate observation, do not affect in the slightest degree the fundamental principles of Phrenology, for Phrenologists have all along drawn a broad line of demarcation between the

* De Penitior. Struct. Cerebri.

effects of size and energy of an organ. And although it has been proved that the brain attains its full size at the seventh year it has not been insinuated that its organization is perfected at that period. We know, indeed, that the brain is much softer at the seventh than at the twenty-fifth year. It is obvious, therefore, that after the brain has attained its full size, internal changes are still in operation; and these changes are as necessary for the full manifestation of the intellectual operations as that of the full external development itself. Besides, the measurements of the Wenzels do not lead to the conclusion, that the cerebrum and cerebellum are exactly of the same size, and much less of the same form, in *all* individuals—quite the reverse. They found the greatest disparity in these respects; and, consequently, the heads of children of seven years of age differ as much from each other as at later periods of existence, and are fitter subjects of phrenological observation, than the heads of the more advanced in life. The history of Phrenology speaks strongly in favour of this opinion, and Gall seems to have been peculiarly attached to the study of Phrenology on the heads of young persons. The brain at that period is less concealed; the skull, muscles, and integuments, are extremely thin; the frontal sinuses are not then developed; and as the brain is then fully formed, it is clear that every thing concurs to render our ideas of the configuration of the whole brain, and of the relative size of the individual parts more accurate, than at the advanced periods of life.*

* To those who have not examined carefully into the matter, the statement in the text may appear startling or incredible, and the

In the heads of man and all vertebrated animals there are two parts, the cranium and face. The one contains the brain, and the other lodges the principal organs of sensation, particularly the organs of sight, smell, and taste. If these organs are greatly developed, the greater is the size of the face, and the greater its relative proportion to the cranium. On the contrary, the larger the brain the greater must be the capacity of the cranium, and the greater its proportion to the face. On these principles a large cranium and a small face indicate a large brain with a restricted development of some of the external senses, but a small cranium and a large face is admitted by all physiologists to indicate the opposite character. So much have physiologists been persuaded of these facts, that they have laboured for centuries to discover some criterion by which the proportion of brain and consequent proportion of intellect could be discovered in living animals. Camper

palpable increase of size of the *head*, which takes place after the seventh year, may seem a decided refutation of the allegation. But it must be remembered that the increase which takes place after the period above mentioned, is easily accounted for from the growth of parts *exterior* to the brain. In the child at that period, the cerebral *envelopes* are extremely thin; they afterwards become thicker and thicker by an increase of skull, of fat, of muscle, and of skin: the additional growth of these parts accounting most satisfactorily for whatever increase of size the head may have attained. Some phrenologists believe that the organs grow from the effects of mental exercise even after a very late period in life, and casts of the same individuals at different periods of their lives are adduced in support of the supposition. In all such cases which the writer had an opportunity of examining, the increase was obviously external, for the *face* had increased in the same proportion. After attaining full growth, the brain, like the eye, neither increases nor diminishes in size; its consistency or density may vary, but we have no reason to believe that any change takes place either in its form or size.

was the most successful of these inquirers, and his principles, so far as they go, are consonant with Phrenology. If a line be drawn from the upper jaw by the side of the nose over the most prominent part of the forehead, it will form an *angle* with another line drawn horizontally from the nostril to the opening of the ear. This is the celebrated facial angle of Camper. The angle varies with the form of the brain. It is more obtuse or open as the forehead advances, and with the retreating of the forehead it is the more acute.

The facial angle of the *Horse* in this way,

measures	23°
Ram, . .	30°
Dog, . .	35°
Ourang-Outang,	56°
European Adult,	85°

While phrenologists admit, to a certain extent, the justness of Camper's principles, they know that his plan is defective. It cannot indicate particular talents. The phrenological system, however, has this great superiority, that it leads to a just estimate both of the general powers of the mind and of the peculiar talents and dispositions of the individual. Camper's views are so far phrenological, that they not only imply the brain to be the organ of the mind, but they even imply that the *anterior part* of the brain is more intimately connected with the intellectual powers than the others. Camper's measurements refer only to the anterior parts of the brain, and his general conclusions regarding these parts are not inconsistent with Phrenology. But will any such measurements of the developments of the *lateral* and *posterior* parts of the brain lead us to

a just conclusion regarding the sagacity of the animal or the intelligence of man? By no means. No physiologist has fallen into the absurdity of supposing this. But does it not follow, that if we cannot estimate the intelligence of the individual from the *lateral* and *posterior* parts of the brain, as well as from the anterior, that all these parts cannot be concerned in the same function? Here then is another argument in favour of the opinion, that different parts have different functions, or, in other words, an argument favourable to phrenology. The doctrine of Camper then is in harmony with the phrenological system.

CHAPTER V.

Phrenological Nomenclature.—Fundamental Powers of the Mind.—The Essence of the Mind an improper Subject of Investigation.—Short Notification of the Fundamental Functions of the Phrenological Organs, and Abuses to which some of them give rise.—Size of the Organs.—Activity of the Organs.—Temperaments.—Combination of the Organs.

Many object to the phrenological nomenclature. The names of some of the organs, it may be admitted, are by no means fascinating; but if the *thing* is correct we ought not to dispute too much about the terms in which it is conveyed. The founders of the system had difficulties to contend with which only few can appreciate; and surely we can bear with them a little should they have imposed upon us names which are not strictly conformable to the genius of our language. At the

same time, the terms are formed upon a principle more philosophic than may at first sight be imagined. The terms characterizing the *propensities* are derived from a fundamental word, which is usually sufficiently plain. Take constructiveness for example. The fundamental word is *construct,* the meaning of which is perfectly obvious. To the fundamental word, *ive* is added, which indicates the power of producing, and *ness* is still farther added, which expresses an abstract state. The vocable *ous* is used in some instances to characterize a *sentiment*, as cautious, conscientious, and *ness* is added, as in the former instances, to point out the abstract condition. At the same time, the names of many of the sentiments, and of all the intellectual powers, are formed of common terms, such as *love of approbation, self-esteem, hope, form, colour, order, comparison,* &c. To these terms no serious objection can be made; they are expressive, and can never be misunderstood. The phrenological nomenclature, however, has given birth to no small merriment among those who cannot look beyond the surface of things. Such terms, it is said, are too outlandish for common use; but where is the science without its technicalities. Anatomy, chemistry, botany, and mineralogy, are full of them; but shall we despise, reject, or laugh at those sciences, merely because the nomenclature may not be to our liking? The weakness of the objection is rendered still more apparent, when we remember that out of 35 or 36 technicalities, three-fourths of them are found with precisely the same import in all our standard English dictionaries. The few remaining terms, are no doubt, to a certain extent *new;* but so are the ideas they are made

to represent. Even of these few, four are compounded of the common English words, *adhesive, acquisitive, constructive, ideal,* to which no objection can rationally be made. Four are compounded of words less purely English, but still of words in use. These are *amative, concentrative, combative,* and *secretive.* The only term in phrenology, derived exclusively from a foreign language, is *philoprogenitiveness,* a term which is no doubt rather uncouth as an English word; but which expresses more powerfully the meaning intended to be conveyed, than any other term which can be employed. It may even be conceded to the opponents of phrenology, that the phrenological terms, like the technicalities of every science, are harsh and unwieldy; but, notwithstanding, they are neither illogically compounded, nor unphilosophically applied.

It is of the utmost moment in investigating the phenomena of mind, to ascertain what mental powers are *fundamental.* Philosophers have hitherto attempted to arrive at this wished for result solely by reasoning, but have they been successful or attained unanimity upon the subject? Have they not arrived at as many different conclusions as the number of investigators? They have besides erred in generalizing too much. They have referred all the actions of animals to something they call *instinct,* and the thoughts and actions of men to *intellect.* One bird as soon as it is hatched runs into the water, and they say that it does so by instinct. Another sings by instinct. Others migrate by instinct. Some animals make provision for the winter by instinct. Now, though we shall not call in question the propriety of such a

term, can we suppose that *one* condition of the brain will explain all these various instincts? If we do not admit that animals have positive knowledge, we must both admit that they have determinate instincts; and that these powers, whatever they may be, are alone the gifts of nature. All the actions of men have been referred to *intellect;* but though intellect is necessary for the successful prosecution of human affairs, yet can it be explained how one man can excel in painting and not in music; how one man may possess a nice taste for music, and exhibit no talent for mathematics or poetry; or how a man may be a natural orator, and excel neither in poetry nor mathematics? This diversity of talent, I am aware, has been attributed to the peculiarities in the mental constitution, and the opinion is so far just; but it is not sufficiently explicit. Men are born with intellects or understandings which differ materially from each other, so that there are particular kinds of understandings as there are of instincts among the inferior animals; and Phrenology demonstrates that each kind of understanding has a particular instrument for its manifestation.

Dr. Gall attempted to compare the parts of the brain with the powers of the mind as inculcated in systems of philosophy. But he could arrive at no satisfactory result. He then compared the developments of different parts of the brain with the *actions* of men, and he had soon reason to congratulate himself on his success. And is it not an undoubted fact that some men show a disposition to certain actions from their earliest childhood;

some to music, some to drawing, some to calculation, and some to constructing mechanical instruments, &c.? The ancient philosophers maintained that all genius is inherent; nay they went farther, they advocated the doctrine that every idea is innate. But the phrenological doctrine is exceedingly different. Phrenologists maintain that the dispositions of mankind are innate, in the same way that the power of locomotion or vision is dependent on organs that are born with us; but as we cannot foretell what kind of muscular movements may take place, or what things may be seen, neither can the ideas which may arise in the mind be foretold as they depend on circumstances which are contingent.

Phrenologists admit those powers of the mind to be fundamental, which exist in one kind of animal, and not in another; which differ from or are not proportionate to the other faculties of the same individual; which appear or disappear earlier or later in life, than other faculties; which act or rest singly, and which may singly preserve their proper state of health or disease.* Now if the phrenological doctrines be tried by these tests, they will not be found defective. Not one of the powers which Phrenology has developed can be dispensed with, or its place supplied by any other power.

A question extremely interesting and intimately connected with this point arises. Is mind itself simple or is it compound? Metaphysicians and philosophers generally admit it to be simple, and that the

* See Combe's System.

various powers which it displays are but so many states or conditions of the same indivisible essence. The feeling of personal identity which we generally experience under every state of being, would naturally lead us to this conclusion, and the majority of phrenologists are of that opinion. But many entertain very different views. The question cannot be decided by observation. We do not know in what the essence of *matter* consists, and it is far more difficult to dispel the thick darkness which veils the essence of the mind. At the same time the argument drawn from personal identity is far from conclusive, as individuals have occasionally become insane on that subject, and on no other. Such persons lose all consciousness of their past and proper personality, and imagine themselves different persons altogether, while in other respects they feel and think correctly. Now, if the feeling of personal identity arose from the unity, indivisibility or singleness of the essence of the mind, how could that *feeling* be lost while the powers of the mind remained entire. But if we admit that the mind consists of an aggregate of powers, we could easily suppose that one of these powers could supply the feeling of personal identity, and be lost and recovered like any of the other powers.

Some curious cases of this kind are on record.* They seem to lead to the inference that the feeling of personal identity is a primitive mental affection connected with a cerebral organ, and hence liable separately to disease. At the same time many eminent

* See Medical Repository, for 1816.

phrenologists entertain the opposite opinion; among these we might mention, Dr. Gall and the Rev. Dr. Welsh. Dr. Gall says, "In my opinion, there exists but one single principle, which sees, feels, tastes, hears, touches, thinks, and wills. But in order that this principle may become capable of perceiving light and sound,—of feeling, tasting, and touching,—and of manifesting the different kinds of thought and propensity,—it requires the aid of various material instruments, without which the exercise of all these faculties would be impossible."*

Dr. Welsh, argues strongly for the individuality of the mind, the thoughts and feelings of which alone, he supposes, are manifested through the organs of the brain. "The leading doctrine of Phrenology," he says, "is that different portions or organs of the brain are connected with the primitive feelings of the mind. The truth of this position can obviously be ascertained only by observation. But taking it for granted that it is true, it may be asked how it can be reconciled with the great principle to which so frequent reference has been made, that the powers, thoughts, and feelings of the mind are not different from the mind, but merely the mind itself existing in different states?

"It requires but little reflection to be satisfied that the introduction of cerebral organs does not in any degree affect Dr. Brown's leading principle. The cerebral organs are not the mind—nor is any state of these organs the mind. The mind we believe to be a simple and indivisible substance. And the only differ-

* Sur les Fonctions du Cerveau, i. 243.

ence that the doctrines of Phrenology introduce in regard to Dr. Brown's principle is, that, instead of the feelings and thoughts being merely the relations of the simple substance *mind* to its own former states or to external objects, they are the relations of the simple substance *mind* to certain portions of the encephalon.

"In looking upon any object—as snow—we have the notion of a certain colour. Now the notion is not in the snow but in the mind. That is, the notion of colour is the mind existing in a certain relation to an external object. But it is allowed on all hands, that there is an intervening step between the snow and the mind: there is an affection of the optic nerve. The notion of colour, then, is the mind existing in a certain relation to the optic nerve. It will be conceded that this does not alter the question as to the simplicity of the mind. And if this is conceded, it is abundantly obvious that another step in the process might be conceived without taking away from the simplicity of the immaterial part, and that, instead of an affection of the optic nerve being the immediate antecedent of the notion of colour, it might be a particular portion of the encephalon. As the notion of colour, upon this supposition, is a relation of the mind to the organ of colour, it follows, that, if that organ were changed in any respect, the state of the mind would also be changed. Thus, if it were larger, or of a finer structure, or more active, the perception of colour would be more delicate, or quick, or pleasing. The same remarks might be extended to all the organs. Where the organ of Causality is large, as in the case of Dr. Brown himself, then there will be a tendency to reason; which ten-

dency is a state of the mind in relation to a material organ, which state would have been different had the organ been different.

"A multitude of organs may all be affecting the mind at the same instant, and in that case a variety of feelings will be experienced. But still the mind is simple, and it is only its relations to these different organs that are complex.

"When we say, then, that when we have any power, as, for example, of reasoning, we are not to suppose that the power is different from the mind. There is a material organ which is separate from the mind, but the perception of relation is a state wholly mental. One state of the organ may give the perception of relation, another the desire to perceive or discover it; but the perception and desire are both attributes not of matter but of mind.—The effect of the organ being large or small, active or inactive, in different individuals, or upon the same individual at different times, is the subject to which I alluded in the chapter on Cause and Effect, as that which Dr. Brown had not considered."*

Fortunately in studying Phrenology we are not called upon to decide concerning the essence of the mind. It is to the powers and faculties of the mind only that we have to direct our attention; and observation has enabled us to decide that every primitive propensity, feeling, and intellectual power, is connected with a cerebral part or organ. What the mind may be, stripped of this mortal coil, we cannot say. We have no experience of it in that state; and instead of entering upon such a fruitless

* Welsh's Life of Dr. Thomas Brown, p. 521.

speculation, it is better, as Dr. Welsh has remarked, to follow the precept of the poet, to "Wait the great teacher death, and God adore."*

The greatest philosophers of the present day, admit that all subjects connected with the *essence* or nature of the mind, lie beyond the reach of human investigation. Mr. D. Stewart is quite explicit upon the subject. "Speculations regarding the nature of mind," he says, "seem now to be universally abandoned, as endless and unprofitable." This is a most important and just admission, but, if the mind, as divested of humanity, is not a legitimate subject of inquiry, there can be no possible objection to the study of the mind in connection with the body, or in other words, in connection with organization. By studying properly the organization, it is obvious that much light will be thrown upon the mental phenomena, and even Mr. Stewart, who has neglected this mode of investigation altogether, has so far stumbled upon the true philosophy, as to recommend such a mode of inquiry, in terms of unqualified approbation. "Among the difficult topics," says Mr. Stewart, "connected with the natural history of the human species, the laws of union betwixt the mind and body, and the mutual influence they have on one another, is one of the most important inquiries that ever engaged the attention of mankind, and almost equally necessary in the science of morals and of medicine." But does Mr. Stewart in the whole of his beautiful speculations, once attend to this most important rule of practice? No. Like other philosophers of the same school, he uniformly proceeds upon

* See Combe's System.

the principle, that the " objects of metaphysical speculation are the immaterial properties of an immaterial being:"—a principle which is not only at direct variance with the position above stated, but which leads to the total exclusion of observation in metaphysics, and *a fortiori* to the investigation of mind, independently of organization. When you investigate the properties of *matter*, these philosophers will tell you to open your eyes and exert all your senses to the utmost: but when you study the phenomena of mind, you must shut your eyes, lull all your senses, and attend only to the workings of your own minds, or to the operations of consciousness. But if the study of the influence of the corporeal organization upon the mind really be of such importance as Mr. Stewart has granted, how can this influence be discovered without observation. The brain is the organ of the mind, and if the mental manifestation can be influenced by the organization, as Mr. Stewart admits, how can we arrive at just conclusions connected with this subject, unless our eye be steadily fixed upon the corporeal organ of the mind, and the states and conditions of that organ carefully noted. Consciousness can obviously avail us nothing in this "important" part of the investigation. Delirium we all admit is a particular state of mind, and a state that uniformly exists during inflammation of the brain. Now suppose the question to be, whether this condition of the mind we call delirium, could be more satisfactorily investigated, by attending to the workings of our own minds, or to the state of the corporeal organ, we would be at no loss to give a satisfactory answer. When the question is placed in

this form, it is stripped of some of its complexity, and the importance of attending to the state of the organization, rather than the operations of consciousness, is at once apparent. Pure reasoning never could lead us to a just conclusion upon such a subject, and had medical science been investigated in this way, into what a tissue of absurdities it would have led!

In these days of philosophic *observation*, an inquiry therefore into the origin and nature of the mind would justly appear absurd and ridiculous. It was not however always thus. To the ancients, the *soul*, the *mind*, the *spirit*, or by whatever name it was known, was a fertile subject of speculation. It may not be uninteresting to glance at the views of our ancient worthies upon the subject. Some of the ancients believed the mind or soul to exist from all eternity, and that it is incorporeal and immortal. Plato entertained these views, and supposed still further that its primary locality was amongst the stars, and that when it grew weary of celestial objects, it infused itself into an earthly body at the moment of its birth. Aristotle surmised that it did not exist from all eternity, but that it begins to exist at the time when the body is born, and that it is infused into the body the instant it is born, and continues in it till death, when it returns to heaven. Other philosophers were of opinion that the souls of men descended into the *shades* or into hell, though not all into the same place —some were thrown into Tartarus, the lowest abyss of the infernal abodes, and others, who had deserved better treatment, were conducted into the pleasanter fields of Elysium. Ennius maintained that the body returned into the earth, and that the soul flew away into heaven,

and that the *shade* or *ghost*, which he insisted was the image of the soul, went into hell. Pythagoras believed the soul to exist from all eternity, to be incorporeal and immortal, and to migrate from body to body, whether of men or beasts till the end of the world: but many others believed the soul to be corporeal and mortal. Of these we may mention, Heraclitus, Democritus, Epicurus, Hipparchus, Hippo, Thales, Hippocrates, Xenophanes, Parmenides, Empedocles, Lucretius, &c. Agreeing as these philosophers did in the materiality and mortality of the soul, they differed most widely regarding its nature. Hippo and Thales supposed it to consist of water; Heraclitus, Democritus, and Hipparchus of fire; Xenophanes of water and earth; Parmenides of earth and fire; Empedocles, of all the four elements, fire, air, earth, and water; and Critias, of blood;—opinions sufficiently contradictory to assure us that all cannot be well founded, or rather that the subject is one beyond the reach of human investigation, and cannot therefore be a legitimate subject of inquiry.

Phrenologists investigate the powers of the mind in connexion only with the brain, and thus simplify mental philosophy by reducing it to a branch of physiological science.

Phrenologists however, admit two great orders of mental powers, *Feelings* and *Intellectual Faculties*. Although usually confounded by philosophers, these two kinds of mental powers are essentially different. Man is said to be a reasonable being, and although the observation is just to a certain extent, yet are all his actions the result of reason? Are not many of his actions such as reason cannot approve? Is he not frequently influenced

by feelings alone, and feelings which are purely of an instructive character? Are there not such feelings as sexual desire and parental attachment? But are *they* the result of reason? Do we not find them in powerful operation even in the inferior animals? and asserting occasionally their independent character in man, by rising in awful activity even when reason objects, or is absent as in sleep? I think we must admit this, and if we do, we admit, at the same time, the correctness of the phrenological classification of the mental powers into *feelings* and *intellect*. Many are inclined to admit that the brain is connected in some inexplicable manner with the purely intellectual powers, but they refer the feelings to other organs, as the heart, liver, stomach. Hence they speak of a good head, a bad heart. But is the heart the seat of the moral feelings? If it were so, or if the moral feelings spring from it, or any other organ except the brain, we would find these feelings in a higher degree than in man, for these organs are larger and of a finer organization in some of the mammiferous animals, than in man. Phrenologists maintain, that all the feelings have their seat in the brain, and that it is more easy to prove the connexion between the feelings and certain parts of the brain, than to show the connexion between the intellect and that organ. The Feelings have been arranged into two genera, Propensities and Sentiments. The first are those feelings which give impulses to act in a certain determinate manner, as the sexual, the parental, &c.; and the second are those which modify the propensities, as self-love, religious feeling, benevolence, &c. All the propensities are feelings strictly of the animal kind, and

common to man and inferior animals. The sentiments are feelings of a higher description. Some of them are found existing to a certain degree, in a few of the inferior animals, but the greater part of them are peculiar to man. The organs of the Propensities are situated at the posterior and inferior part of the brain, and when such parts of the brain are more largely developed than the others, the individual in whom such a conformation exists, is unfit for any thing great or noble. His happiness lies entirely in animal gratification, and he attempts to gratify these feelings, reckless of the peace or happiness of others.

The organs of the Sentiments are situated at the crown of the head, and when very fully developed, impart a benignity and grandeur to the individual which is never found in conformations of a different kind. All artists who have studied nature know this, hence we find them giving the requisite elevation to the heads of characters famed for moral and religious qualities. But could they represent such a character as Shakspeare's Caliban with such a conformation? If they did, they would shock our ideas of natural consistency. Caliban could only be properly represented with a forehead, " villanously low," or if we give him a different conformation, we would change his character; he would no longer be Caliban. The sculptor, the portrait, and historical painter, can appreciate the truth of these observations. They have studied practical Phrenology, without knowing, it may be, that there is such a science. Their works, indeed, are so many phrenological illustrations, and the closer they copy nature, the more truly phrenological they become.

The powers purely intellectual, have been arranged by phrenologists into two kinds. 1st, The *knowing*, or *perceptive* powers, or those faculties which enable us to form ideas of physical objects and their qualities: and 2ndly, The *reflective* powers, or those faculties by which we compare and judge. The organs by which these powers are manifested, are situated in the *forehead*, and it has long ago been remarked, that with the development of this part of the brain, the intellectual powers are the stronger. The *organs* of the *knowing* faculties are situated at the lower and middle parts of the forehead: and those of the reflective faculties, at the uppermost part of the forehead. We seldom find these two great sets of organic parts equally developed. In the majority of mankind, the lower part of the forehead is the larger. Hence, we find the majority of mankind, better adapted for observing and collecting facts than for reasoning correctly, or drawing just conclusions from the facts with which they are acquainted. When the upper part of the forehead is the most protuberant, the individual so constituted, is fond of reasoning. He is apt to generalize too much. The knowing organs being comparatively less developed, dry facts have to him no attraction. Every fact and every event excites his reasoning power. On a single fact he will erect a theory. He reasons profoundly, but his reasonings are too speculative to be useful. When both knowing and reflecting organs are fully developed, and in nearly an equal degree, the individual so constituted has the best possible intellectual conformation. He gathers with avidity, knowledge from every quarter. He reasons also profoundly, but

facts are the foundations of his reasonings and inductions. Such a conformation exists in an eminent degree in Lord Brougham ; and need I say, that his character is such as phrenologists would expect from the conformation.

In investigating any of the powers of the mind, we ought, 1st, to observe the power as it exists in man, and the relationship it bears to his corporeal organization. 2d, The power as it exists in inferior animals, (when such is the case) and the relationship it bears to their organization. 3d, The power as it appears during insanity. 4th, The essential nature of the power as divested of all extraneous circumstances, or in its insulated state, and, 5th, The modifications which the power undergoes from particular combinations of organs. It may be necessary to make a remark or two on each of these topics.

In investigating any power of the mind, we must like Dr. Gall, refer to the *actions* of men for no other mode of inquiry will lead to a satisfactory result. By attending to the workings of our own minds, we at best obtain an imperfect view of human nature :—we obtain a view of the mental phenomena appertaining to the *individual*, and not to the species, and thus study mankind under a false light, and through a distorting medium. Dr. Gall showed us how to avoid this error :—how to walk out of our little selves, and to view the workings of the human mind as they appear in the broad light of day, and in the face of society. The *actions* of men are facts which cannot be disputed, and which alone can lead to just conclusions regarding the mental state : for, if actions of a particular kind are

performed only by persons of a particular conformation of brain, the relationship can be easily established, and an important step gained towards the elucidation of the mental condition : for though the act itself whatever it may be is necessarily different from the mental state, yet a knowledge of the concomitancy between the cerebral conformation, and the specific character of the act will sooner or later lead to a knowledge of the mental condition from which the act springs.

2dly, In studying the constitution of the human mind, we are also much assisted in observing the mental phenomena of the inferior animals, as displayed in their acts, and in relationship with their organization. The psychology if we may so speak of the inferior animals is a subject of deep interest, and calculated to throw a blaze of light upon some parts of the mental constitution of man. The *feelings* in these animals are generally of a simpler character than in man, and consequently better adapted in that state for observation. They are also less under the control of intellect, and therefore brought nearer the essential or primitive type, the state sought after so eagerly by all mental philosophers. Besides, the infinite variety of these animals, and the unlimited control over them which we possess, their instincts often appear at determinate periods, and continue for a time in an overwhelming state. They are thus magnified to suit as it were our imperfect senses, and materialized to render in some measure tangible what in ourselves is more pure and etherialized.

3dly, The mental powers ought to be studied as they appear in the insane. Gall was the first of philo-

sophers who investigated insanity aright, and traced it to its true cause, and there can be no doubt that the proper investigation of insanity will lead to correct ideas of the sane condition of the mind. The insane man is in some measure like an inferior animal. His feelings are either not under the control of intellect, or the intellectual powers are incapable of acting in concert: there is at all events a difference from the healthy state, and the investigation of that difference, and the causes upon which it depends will necessarily lead to more correct conclusions of the sane condition of the mind.

4thly, The essential or fundamental character of the mental powers, ought particularly to be investigated. Observation alone will not lead us to this result. Gall himself with all his talents of observation, could not find out the primitive character of some of the mental powers which he discovered. Is observation then of no consequence in the elucidation of this subject? Far from it. Accurate and extensive observation will give us the data upon which our conclusions must rest, and if our reflecting powers are well developed, our conclusions will be sound in proportion to the extent and accuracy of our data.

We are now prepared to give a short sketch of the *situation*, *uses*, and *abuses*, of the phrenological organs. The reader who wishes a fuller elucidation of the subject, should consult the last edition of Mr. Combe's excellent system of phrenology, a work which redounds to the credit both of the literature and philosophy of the country in which we live.

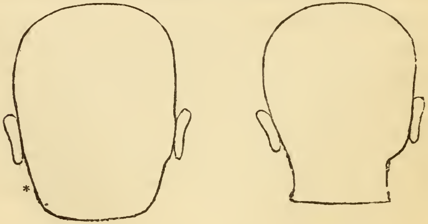
SHORT NOTIFICATION OF THE PHRENOLOGICAL ORGANS AND PRIMITIVE FACULTIES OF THE MIND MANIFESTED THROUGH THESE ORGANS.

ORDER I.—FEELINGS.

GENUS I.—PROPENSITIES—COMMON TO MAN WITH THE LOWER ANIMALS.

THE organs of the Propensities are *situated* at the *back* part, at the *sides*, and at the *base* of the brain. We might thus make a threefold division, which would assist materially in recollecting them. Those organs that lie fairly in the back of the head are the three following:—1st. Amativeness, which is situated lowermost of the three, and which imparts a breadth and prominency to the upper part of the *neck*. 2d. Philoprogenitiveness, which lies immediately above the former, and usually in the female, constitutes the most prominent part of the hind-head; and 3d. Inhabitiveness, which lies immediately above the last, midway between it and the part of the head where the hair turns backwards.

1.—AMATIVENESS.



LARGE. SMALL.

Use:—To produce sexual love. *Object:*—The pro-

pagation of the species. *Abuses*:—Fornication, adultery, incest, and other improper, illegitimate, and criminal modes of gratification. Its *inactivity* produces passive continency.

2.—Philoprogenitiveness.



Small.



Large.

Use:—To produce love of offspring, and affection for young and tender beings. *Object*:—Preservation of offspring. *Abuses*:—Pampering and spoiling of children, and excessive sorrow for their loss. When *inactive*, it produces carelessness for children.

3.—Inhabitiveness.*

Use:—Imparts a feeling of attachment to, and a desire of permanence *in, place*, and probably confers also the power of fixing and rendering permanent our ideas and emotions. *Object*:—Self-preservation in inferior animals, as it induces them to select places best adapted for their organization. *Abuses*:—Aversion to the active duties of life, home-sickness, a brooding over morbid mental impressions.

The organs of the Propensities *situated* at the *side* of the head, extend in two irregular lines along the

* Concentrativeness.—*Combe.*

lower part of the cranium, from philoprogenitiveness to the outer side of the socket of the eye. Two of these organs lie behind the opening of the ear, and when large impart breadth to the back part of the head; two lie immediately above that opening, and two before it. The organs that lie behind the ear are placed the one somewhat before the other. The two that lie immediately above the opening of the ear are so disposed, that the one is placed exactly over the other, and the two situated anterior to the ear hold a relationship somewhat similar to the two behind the ear. *Adhesiveness* lies by the side of *Philoprogenitiveness,* and *Combativeness* descending betwixt *Adhesiveness* and the opening of the ear. Of the two situated exactly over the opening of the ear, the lower one is *Destructiveness,* which is surmounted by *Secretiveness.* Before *Secretiveness,* and upon a higher level, we find *Acquisitiveness;* and still farther forward, and a little lower, near the outer part of the eye in the temples, we find *Constructiveness.* At the same time no description, however accurate, will enable the student to attain a correct idea of the situation of these organs, without referring to the plates, or what is better, to the mapped busts.

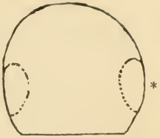
4.—Adhesiveness.

Use :—Attachment to persons. *Object :*—Friendship and society arise from it. *Abuses :*—Attachment to worthless or improper persons; inconsolable grief for the loss of a friend. Its *inactivity* produces carelessness about others.

5.—Combativeness.



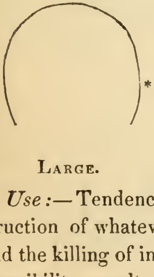
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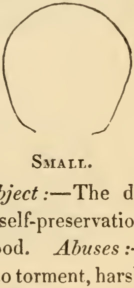
Large.

Use :—Tendency to oppose and attack. *Object :*—Defence, intrepidity, courage. *Abuses :*—Love of disputation and contention, quarrelsomeness. Its *inactivity* predisposes to peaceableness, and aversion to wrangling.

6.—Destructiveness.



Large.



Small.

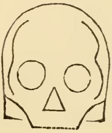
Use :—Tendency to destroy. *Object :*—The destruction of whatever is noxious for self-preservation, and the killing of inferior animals for food. *Abuses :*—Irascibility, cruelty, murder, tendency to torment, harshness, severity, &c. Its *inactivity* gives rise to passive meekness.

7.—Secretiveness.

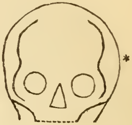
Use :—To *conceal* our thoughts or actions from

others. *Object:*—To prevent our involuntary thoughts and emotions from being exposed to public view. *Abuses:*—Quizzing, cunning, deceitfulness, lying, &c. When *inactive*, it predisposes to simplicity of manners.

8.—Acquisitiveness.



Small.



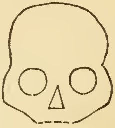
Large.

Use:—The tendency or desire to *acquire. Object:*—To provide for future wants. *Abuses:*—Excessive worldly-mindedness, selfishness, avarice, theft, &c. Its *inactivity* leads to a carelessness for property.

9.—Constructiveness.



Large.



Small.

Use:—Imparts the desire and tendency to construct. *Object:*—To induce all endowed with the feeling to protect themselves from the inclemencies of the weather, and from other dangers. *Abuses:*

Construction of whatever may have an injurious tendency, or any thing from improper motives.

The organs of the Propensities that lie in the *base* of the brain are beyond the reach of observation in the living subject; accordingly, phrenologists have not yet arrived at any decided conclusion regarding the function of these organs. Some suppose that the organ of the *love of life* is situated in some part of the middle lobe—an opinion, we conceive, at best only probable. It is more than probable, however, that the instinct for food emanates through some other part of the inferior surface of the middle lobe. This instinct has been denominated Gustativeness, or Alimentiveness, which, when large, imparts a swell to the head at the temporal arches before and a little below the opening of the ear. In the phrenological busts it is marked with a cross.

Gustativeness.

Use :—Imparts the desire for food. *Object* :—To enable the animal to select food best adapted for its organization. *Abuses* :—Inordinate desire for the pleasures of the table, gluttony, drunkenness. Its *inactivity* disposes to temperance in eating and drinking.

Genus II.—Sentiments.

The organs of the Sentiments are *situated* in the superior region of the brain, and, when large, impart both a breadth and elevation to that region of the head. Their exact situation must be learned from the

bust. It may be stated, however, that these organs are all double, as in every other part of the brain; but that those in the middle line of this region, from their proximity, (although in different hemispheres of the brain,) are figured on the busts as if they were single. Four of these organs lie along the middle line of the head, and when examined from behind forward, hold the following order:—1st. Self-esteem, which lies farthest back, and immediately before and above Inhabitiveness. 2d. Firmness. 3d. Veneration, which corresponds with a line drawn over the crown from the one ear to the other. 4th. Benevolence, which extends from the last mentioned to the upper part of the forehead. By the sides of these the other organs of the sentiments are found allocated in the following manner:—By the side of Self-esteem we find the Love of Approbation; and by the side of this last, and a little more anteriorly, the organ of Cautiousness, which corresponds with the centre of ossification of the parietal bone, and a certain distance around that point. By the side of Firmness, Conscientiousness is situated. By the side of Veneration, Hope and Wonder are found. Lying a little to the side and stretching farther forwards than Hope, and by the side of Benevolence, we find Imitation; and at the outer and lower margin of which Ideality is found, bounded in front by Wit.

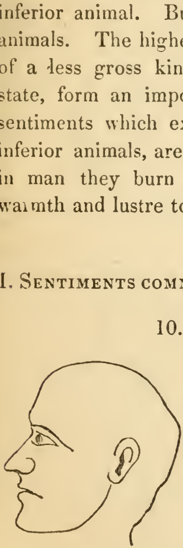
The organs of the *Sentiments* differ from those of the *Propensities*, not only in situation, but in function. The Sentiments are feelings of a refined kind, the exercise of which is accompanied with an emotion; but no emotion attends the exercise of the Propensi-

ties. The Sentiments have been simply arranged into, 1st. Sentiments common to man, with some of the lower animals; and, 2d. Those proper to man.

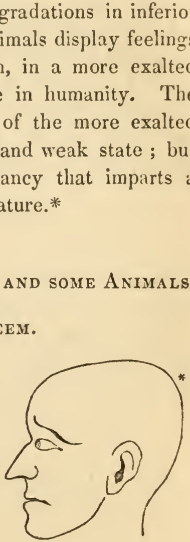
Some have viewed it as a prostitution of the term *Sentiment*, to apply it to any instinctive power of an inferior animal. But there are gradations in inferior animals. The higher of these animals display feelings of a less gross kind, and which, in a more exalted state, form an important feature in humanity. The sentiments which exist in some of the more exalted inferior animals, are in a simple and weak state; but in man they burn with a brilliancy that imparts a warmth and lustre to his moral nature.*

I. Sentiments common to Man and some Animals.

10.—Self-Esteem.



Small.



Large.

Use:—Imparts a love of self. *Object*:—To enable man to prize, and to turn to the greatest advantage,

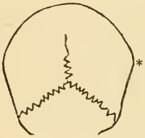
* Aristotle asserts, that a part of divinity is bestowed on man only of "all animals," but afterwards modifies the expression, and says, "or most of all animals." See Part. Animal. l. ii. c. 10, as quoted by Dr. Elliotson in his Human Physiology.

all his powers. *Abuses* :—Egotism, conceit, pride,* disdain, love of power. Its *inactivity* disposes to humility.

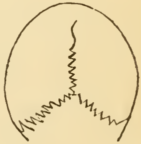
11.—Love of Approbation.

Use :—Desire of the good opinion of others. *Object* :—To induce that conduct in man which will render him generally agreeable or pleasing to *society*. Emulation arises from it. *Abuses* :—Excessive thirst for praise, vanity,* ambition, &c. Disregard of the good opinion of others arises from its *inactivity*,

12.—Cautiousness.



Large.



Small.

Use :—To impart fear. *Object* :—To induce a tendency to *shun* the dangers and evils with which we are

* The following *contrast* of the proud and the vain man, drawn by Gall, affords a beautiful proof of the philosophic acumen of the founder of the phrenological system :—

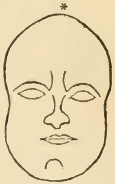
"The *proud* man is imbued with a sentiment of his own superior merit, and from the summit of his grandeur treats with contempt or indifference all other mortals ; the *vain* man attaches the utmost importance to the opinions entertained of him by others, and seeks with eagerness to gain their approbation. The *proud* man expects that mankind will come to him and acknowledge his merit ; the vain man knocks at every door to draw attention to him, and supplicates for the smallest

surrounded. It forms an essential element in a circumspect and prudent character. *Abuses*:—Cowardice, unfounded apprehension, despondency, melancholy, &c. Its *inactivity* produces absence of fear.

13.—BENEVOLENCE.



SMALL.



LARGE.

Use:—It imparts the desire of the *welfare* of others. *Object*:—Places man in relation with other sentient beings, and conduces much to their enjoyment and happiness. *Abuses*:—Prodigality, profusion, too great a facility of temper. Its *inactivity* predisposes to neglect of charitable objects.

II. SENTIMENTS PROPER TO MAN.

The *organs* of such sentiments do not exist in the inferior animals. These organs, therefore, are characteristic of humanity, and impart feelings of morality and religion. They give elevation and dignity to our

portion of honour. The proud man despises these marks of distinction which on the vain confer the most perfect delight. The proud man is disgusted with indiscreet eulogiums; the vain man inhales with ecstasy the increase of flattery, although profusely offered and by no very skilful hand."

moral nature, and fit us for the purest pleasures and the noblest destinies.

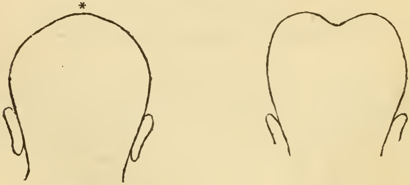
14.—Veneration.



Large. Small.

Use:—To impart the tendency to respect or venerate. *Object:*—To hold men, as members of society, in bonds of closer fellowship. It forms an essential ingredient in religious devotion. *Abuses:*—Servility to superiors in rank or authority, love of the antiquated, superstitious awe. The *inactivity* of the organ produces want of respect to men, and coldness in religious exercises.

15.—Firmness.

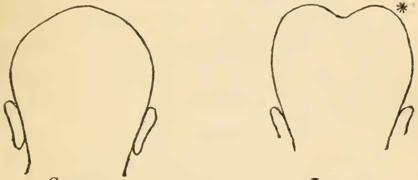


Large. Small.

Use:—Imparts *fortitude. Object:*—Enables us to *bear up* under *evils* and misfortunes which cannot be avoided or overcome. *Abuses:*—Obstinacy, infa-

tuation. Its *inactivity* produces feebleness of purpose, fickleness, and inconstancy.

16.—CONSCIENTIOUSNESS.



SMALL. LARGE.

Use :—Imparts a desire for justice. *Object* :—It fits men for respecting the rights of each other, and forms them for social intercourse. *Abuses* :—Excessive refinement in our views of duty, remorse for actions which are innocent or of no moment. Its *inactivity* leads to forgetfulness of duty.

17.—HOPE.

Use :—Imparts the expectation of future good. *Object* :—It induces men to look beyond the present moment, and anticipate and prepare for futurity. It is an important element in faith. *Abuses* :—Credulity, absurd expectation, love of scheming. Its *inactivity* produces a carelessness of the future.

18.—WONDER.

Use :—Imparts the *love of novelty*. *Object* :—Induces an *interest and delight* in what is new or extraordinary, and thus acts as a stimulus to the knowing and reflecting powers. *Abuses* :—Love of the marvellous, belief in witchcraft, ghosts, or in any thing supernatural. Its *inactivity* produces a disrelish of the

marvellous, and predisposes to a preference of the probable and real.

19.—Ideality.

Use :—Imparts the love of the beautiful and sublime. *Object :*—It leads us to appreciate the indescribable beauties of the works of nature, and to pant after superior excellence in works of art. It is an essential element in poetry and other departments of the *fine arts.* *Abuses :*—Excess of enthusiasm, preference of the gaudy and glaring to the useful : tendency for the imagination to carry captive the judgment. Its *inactivity* produces a homeliness of character.

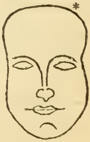
20.—Wit.

Use :—Imparts the feeling of the ludicrous, and forms an essential element in the mental constitution of such geniuses as Shakspeare, Rabelais, Voltaire, or Cervantes.

21.—Imitation.



Small.



Large.

Use :—Imparts the desire and capability of imitation. *Object :*—To assist in expressing with more

effect the natural language of all our faculties, and enable us to imitate works of nature and of art. *Abuses* :—Slavish imitation of others. Its *inactivity* produces *mannerism*.

Order II. INTELLECTUAL FACULTIES.

Genus I.—External Senses.

SIGHT, HEARING, SMELL, TASTE, TOUCH.

Uses :—To bring the animal that possesses them in *communication* with the external world.

That all our ideas are derived from the external senses is one of the oldest opinions in philosophy. That these organs of the senses are great *inlets* to knowledge cannot be doubted ; but it is quite clear that the organs themselves merely receive impressions—they do not form ideas. For the formation of ideas the impressions must be transmitted farther than the senses. Physiologists *now* agree that such impressions are transmitted to the brain, which is said to be the *common sensorium*, and that the mind there takes cognizance of the impression, or, in other words, forms an idea. According to this view, then, the brain is admitted to be necessary to the formation of ideas, else why should the mind not be affected by the organ of sensation without the intervention of the brain. The brain is necessary, then, for the origin of all our ideas, even according to this principle, and the

question naturally suggests itself, whether it is more probable that the *same* portions of cerebral matter should be the parts through which different kinds of ideas should be formed, or that different portions of the brain should be allotted for this purpose. The brain is admitted to be necessary in some way or other to the elaboration of every idea. This is a conclusion which cannot be denied. It is as capable of demonstration as any fact in physiology, and it has already been demonstrated. Now, with this admitted fact fully before us, whether is it, *a priori,* more likely that the same parts should elaborate different kinds of ideas, or that for the formation of every different kind of idea there should be a different part? Take it any way the anti-phrenologists choose, the probability is against them. If they admit that the brain is the material organ of the mind, they admit that the mind cannot think without that organ, even though the external senses are perfect, and as the powers of the mind are various and different, it is, to say the least of it, more than probable that each power has a particular cerebral part for its manifestation.

THE FOREHEAD.

The organs situated in the forehead have been a stumblingblock to the unobservant. Such individuals cannot conceive that so many organs could be congregated in so small a space. But the convolutions of the brain are there equally numerous ; and a little study will enable any one to become acquainted with the situation of all the organs. To facilitate our acquaintance with this interesting part of Phrenology, we may view the forehead as consisting of three *ranges* of

organs—a *lower*, a *middle*, and a *higher*. In the lower and middle, the organs of the *knowing* faculties are situated; and in the highest, those of the *reflecting*. With *three* exceptions, the organs of the faculties that perceive the *existence* and *qualities* of external objects are situated in the *lower* range, side by side, and in the following order:—1st. *Individuality*, which is situated between the eyebrows and over the root of the nose, and *Form*, *Size*, *Weight*, *Colour*, in immediate succession outwards along the course of the eyebrow—*Form* lying rather at the side of the root of the nose than in the eyebrow, and the others corresponding with about the two inner or nasal thirds of the eyebrow or orbitary arch.

The organs that perceive the *relations* of external objects, are situated partly in the *lower* range, but principally in the *middle* one. Three of such organs only are situated in the *lower* range. These are *Order*, *Number*, and *Language*; the two first mentioned occupying the outer third of the arch of the eyebrow—*Order* by the side of *Colour*, and *Number* still nearer the temples at the extremity of the orbitary arch, rounding off the arch and descending a little by the side of the eye. *Language* is situated *behind* all the organs of the lowest range, over the back part of the *roof* of the orbit or socket of the eye, and is beyond the reach of observation; but as it rests upon the back part of the roof of the orbit, it depresses the part of bone upon which it rests, and thus protrudes, more or less, the eyeball itself. We look, therefore, to the prominence of the eye for the *sign* of the size of the organ.

The knowing organs of *relation* are situated in the middle range of the forehead ; *Eventuality* immediately above *Individuality*, in the very middle of the forehead ; and *Locality*, *Time*, and *Tune*, extending in succession onwards, in the order now mentioned, to the temples.

The organs of the Reflective Faculties surmount all the others in the forehead ; *Comparison* in the middle immediately above *Eventuality*, and *Causality* by the side of *Comparison*, and bounded towards the temples by *Wit*.

Genus II.—Knowing Faculties which perceive the Existence and Qualities of external Objects.

22.—Individuality.



Small. Large.

Use :—Imparts the power of *observing* and *remembering* specific *individual existences*, without reference to the uses, qualities, or relations of such existences. It is an indispensable ingredient in a genius for physical science.

23.—FORM.

Use :—Imparts the talent of observing and remembering the *configuration* of bodies, and is necessary to the successful cultivation of many of the imitative arts.

24.—SIZE.

Use :—Enables us to observe and remember the *dimensions* of bodies.

25.—WEIGHT.

Use :—Gives the talent of observing, appreciating, and remembering the resistance and momentum of bodies, and forms an essential element in the genius for mechanics.

26.—COLOUR.

Use :—Communicates the talent of perceiving and remembering colours, and is essential to the painter, and all in whom a nice discrimination of colour is required.

GENUS III.—KNOWING FACULTIES WHICH PERCEIVE THE RELATIONS OF EXTERNAL OBJECTS.

27.—LOCALITY.

Use :—Imparts the power of observing and remembering the *relative position* of bodies; is essential to the landscape painter, topographer, geographer, astronomer, and surgical anatomist, and those requiring a nice discrimination of the relative position of things.

28.—Number.

Use:—Confers the power of observing and remembering the *number* of objects; imparts the talent of calculation; is indispensable to a genius for arithmetic, algebra, logarithms, and all sciences conversant with simple numbers.

29.—Order.

Use:—Communicates the talent of observing and remembering the *arrangement* of objects, and confers an aptitude for methodical arrangement.

30.—Eventuality.



Large.



Small.

Use:—Imparts the power of observing and remembering events or occurrences of every kind, and conduces to the talent of practical details in the affairs of life.

31.—Time.

Use:—To enable us to perceive and remember *duration*, or the relation which one thing bears to another in time. It forms an element in the musical talent.

32.—Tune.



Small.



Large.

Use:—Imparts the power of perceiving and remembering melody. The musical ear depends upon it ; and without which, however acute the *organ* of *hearing* may be, no musical talent can exist.

33.—Language.

Use:—The power of perceiving and remembering the *signs* of our ideas. It takes cognizance both of natural and artificial language, and forms an element in the philological talent.

Genus IV.—Reflecting Faculties which compare, judge, and discriminate.

These are the highest faculties of the mind, and which pre-eminently distinguish men from the inferior animals, and enable him to control and mould to his will with facility and power the whole of the animal creation.*

* "Sanctius his animal mentisque capacius altæ
Deerat adhuc, et quod dominari in cætera possit,
Natus homo est."

Or, to use the words of Milton, when referring to the creation of man—

34.—COMPARISON.

Use :—Gives the power of discovering resemblances, differences, analogies, either among things or ideas, and disposes to the use of figurative language.

35.—CAUSALITY.

Use :—To trace the relation between cause and effect, and the dependencies of phenomena. It imparts a clear conception of logical consequences, and constitutes the principal element in the talent for abstract and *metaphysical speculation.*

Phrenologists calculate the power of the organs of the brain by their size, and when the organs are large, no difficulty can be experienced in discovering them. But is *size* the *only* indication of power in an organ ? by no means ; size is one condition of an organ, and a most important one, but phrenologists also take into account the *activity* of the part ; the opponents of phrenology forget this, and hence the errors into which they fall ; they will tell you that with phrenologists, *size* is every thing; they will then bid you look at the fleetness and bottom of a race horse, compared with the slow and clumsy movements of the gigantic and unwieldy cart horse, and ask triumphantly if size is of any consequence ? but the example now referred to is not a fair one ; the race horse is of a different breed from the cart horse ; all its parts, independently of its muscles, conspire to give it fleetness ;

" Two of far nobler shape, erect and tall,
God-like erect, with native honour clad,
In naked majesty, seemed *lords of all :*

but to place the subject fairly before us, we ought to compare the effects of size, in two individuals of the *same kind*. If we see two cart horses of very unequal size, are we not certain that the larger one is most powerful? and do we not know that among race horses, those in which certain muscles are developed in a greater degree than others, are always the speediest? Among men the same law holds good ; pugilists know that a man of ten stones weight, can never be a match for one of fifteen stones. The man of fifteen stones may indeed, from disease or certain other causes, be weaker than the other, but this can never prove that size is of no consequence ; for, all things being equal, the larger man will necessarily be stronger than the smaller. This remark applies to every organ of body, and why should the brain * be viewed as an exception?

* "Willis has described the brain of a young man imbecile from birth ; its volume was scarcely one-fifth part of that of an ordinary human brain. M. Bonn, professor at Amsterdam, has two little crania of idiots, and the brain of an imbecile who reached his twenty-fifth year, and was so stupid that he was shown for money as an African savage, &c. I have observed heads equally small in many living idiots from birth. All these crania and heads are thirteen or fourteen inches in circumference, and eleven or twelve inches from the root of the nose to the occipital foramen. With from fourteen to seventeen inches in circumference, and from about ten or twelve from the root of the nose to the occipital foramen, we have more or less stupidity—a more or less complete incapacity to fix the attention upon one object—uncertain or transitory feelings and passions—confusion of ideas. Heads of eighteen or eighteen and a half inches in circumference are still small, although they permit a regular exercise of the faculties ; they possess but a sad mediocrity of talent—a spirit of servile imitation—an extreme deficiency of seizing the relationship between cause and effect—a want of self-government, and often few desires. Still some qualities or faculties may be considerable, because particular organs may be greatly developed, forming a striking contrast with the mediocrity of the rest. But as we approach large brains, we see intellectual faculties of greater mag-

In calculating the power of an organ, *activity* or internal state as well as size is attended to, and this must be particularly remembered in calculating the power of the cerebral organs. The activity of an organ may depend upon a variety of causes—on original organization or temperament,* on health, on exer-

nitude, till we arrive at heads twenty-one or twenty-two inches in circumference—the dimensions at which men obtain the height of intelligence."—*See Gall*, Vol. I., p. 196, and Vol. II., p. 322.

* In endeavouring to ascertain the activity of the intellectual power, in any given case, the *temperament* of the individual should be carefully noted. The term *temperament* is another word for original constitution; and although the constitutions of men vary with the individual, and consequently vary *ad infinitum*—yet it has been found practicable to reduce the temperaments of men into a few divisions. Phrenologists generally admit only of four primary or fundamental temperaments, viz.; 1st, The nervous; 2d. The sanguineous; 3d, The bilious; and 4th, The lymphatic. In some individuals the temperaments are *pure*, in others they are *mixed*, and the mixture may exist in various degrees. The nervous, for example, may exist with the sanguineous, or with the bilious, or with the lymphatic; or, there may be a mixture of any three of the temperaments, or, a mixture in various degrees of all the four. The pure or unmixed temperaments may be thus described.

The *nervous temperament* is indicated by delicacy and irritability of frame. The skin is soft and fine, and not thickly covered with hair; the muscles and bones rather slender, and the muscular motions quick and lively.

The *sanguineous temperament* is indicated by a florid complexion, blue eyes, light hair. The skin soft, the superficial veins large, the pulse full and frequent, and the body round and plump.

The *bilious temperament* is known by a complexion of a swarthy or leaden hue, dark eyes, coarse black or brown lank hair, slow pulse. The bones are large, the muscles wiry, and the countenance sombre and melancholic.

The *lymphatic temperament* is distinguished by light hair, light or grey eyes, a pallid complexion. A weak soft pulse, a cold skin, and a torpid state of all the functions. The countenance is soft, heavy and unmeaning. Of these temperaments the nervous imparts *quickness* of mental manifestation; the sanguineous *energy;* the bilious *durability;*

cise. All these circumstances operate on corporeal organs of every kind, and there is, besides, one which is peculiar to the cerebral—the mutual influence of these organs. Exercise alone has a wonderful influence in affecting the power of an organ. We observe this every day in the muscular system. A muscle when kept for some time in a state of inactivity becomes soft and flabby, and incapable of energetic contraction, but let the same muscle be inured to regular exercise, it becomes firmer and redder, and much more powerful. Such is an exemplification of activity in contradistinction to size, in an organ of motion. But may not mental exercise affect in some way the organization of the brain? It is possible that it may render it denser by the greater quantity of blood which is carried to the brain during the process of thinking, and we may have thus actual power imparted, although no increase of size be discoverable. But the energy or activity of an organ can only be imparted in this way to a limited degree; and consequently, where great power is wanted great size is indispensable. This observation applies to every other organ of the body, and why should we suppose that the organs of the brain are exceptions to the general law?

It is a common but very erroneous opinion, that all brains, or what is the same thing, that all heads are alike. The heads of men differ as much as their faces; and all know that two faces have never yet been found perfectly alike. The varieties of form in the human head are, indeed, infinite; hence we can easily explain

and the lymphatic *torpidity*; circumstances which must never be forgotten in estimating the character of any individual.

the infinite diversity of character that exists in society. Compare the heads of members of the same family, and amidst the family resemblances which exist in all, you will be astonished at the striking individual differences. Compare, again, any one of these with others of a different family, and you will not only perceive the difference, but be able to say in what the difference consists. If you extend, then, your sphere of observation, you will soon be convinced that there are national as well as family peculiarities. The English head can easily be distinguished from the French head, and the French and German* from the Turkish or any other.

* Dr. Vimont thus particularizes them. When speaking of the German scull, he says, "The regions of the reflective faculties, of Cautiousness, and of the moral sentiments, are all largely developed. Veneration and Benevolence in particular are well marked. The perceptive faculties considered generally, with the exception of Tune, are moderately developed. The organs of Ideality, Constructiveness, and Gustativeness, are often very prominent, Secretiveness and Self-Esteem are also very conspicuously large.

"The French head is smaller than the German. The region of the perceptive faculties is generally larger, while the organs of reflection are smaller in the French than in the Germans. The organs of Tune and Number are larger in the Germans. The French are generally deficient in the organ of Cautiousness. The organs of Individuality, of Colour, and Form, are generally large in the French, as also those of Comparison, Wit, Wonder, and Poetry. The organs of Constructiveness, Imitation, and of the sense of the beautiful in the arts, are also large in them; particularly the last two. The organ of Love of Approbation or vanity generally predominates. Benevolence is well developed; but Veneration, Self-Esteem, and Firmness are not so."

"During my stay in London, I went almost every Sunday to the churches. The result of my remarks may be shortly stated. Considered generally, the size of the heads of the inhabitants of London do not differ much from that of the Parisian heads: in particular points the differences are very striking. In equal numbers the reflective faculties are more developed in London than in Paris; and the same rule holds in regard to Cautiousness, Firmness, and Self-Esteem. The

All travellers admit this ; and the numerous collection of sculls and casts of the heads of individuals of different nations which now exist, has set the matter at rest. There can be no doubt, then, that there are individual, family, and national peculiarities of head, and are we to suppose that these differences of form are unproductive of differences of character ? Glance for a moment at the forms of the Caucasian, Mongolian, and Ethiopian heads, and then endeavour to draw such a conclusion. To what conclusion would the history of these varieties of mankind lead regarding the forms of their heads ? Would it lead a phrenologist to the conclusion, that the form of the negro head is as fine as that of the Caucasian ? By no means. History tells us that the Ethiopian has always been in a state of extreme barbarism,* while the Caucasian varieties have uniformly displayed high intellectual powers and from time immemorial been the promoters and depositaries of human knowledge. The doctrines of Phrenology would lead at once to the conclusion that the Ethiopian head must be greatly different in form, greatly defective compared with the Caucasian. We know,

organ of Alimentiveness is larger in the English, and to this cause is to be ascribed their love of spirituous liquors. Drunkenness is the predominant vice of the English." Dr. Vimont quotes from Bulwer's "England and the English," the number of persons entering gin-shops within certain periods of time, and adds, "the Scotch, and particularly the Irish, appear to be greatly addicted to spirituous liquors. I have never spoken to an Irishman who has not assured me that idleness, and particularly drunkenness, were the dominant vices of the mass of the Irish population."—p. 489, as quoted by Mr. Combe.

* Individual instances exist among the negro tribes of exalted moral and intellectual endowments, but these are exceptions, and are uniformly accompanied with superior development of the brain.

indeed, that the negro head approaches to the monkey form, and that the negro brain is less developed than that of the Caucasian ; that the anterior lobes are strikingly defective, and that consequently no circumstances short of a change of cerebral form, could make the negro equal to the Caucasian.

There is an endless variety of form in the human head, and to satisfy himself on this point, the reader might first consult the writings of Cuvier, and particularly the first volume of his Animal Kingdom, in which the forms of the heads of the three grand varieties of mankind are particularly described ; then he might turn to Blumenbach's plates of the crania of different nations. Blumenbach enumerates five varieties of mankind, the Caucasian, Mongolian, American, Ethiopian, and Malay, and the sculls of which may be thus described. In the Caucasian variety the scull is fully developed in the upper and front parts, these forming a large and smooth convexity, a little flattened towards the temples : there is a general softness, harmony, and proportion in the entire contour of the head. Some differences in the formation of the scull have been observed in different nations of the Caucasian race : in the Turks, for instance, a singular globularity of this part has been remarked, and in the Poles and Russians a considerable contraction of the orbits. But we have not sufficient information on this subject, to lead us to any definite conclusions.

In the Mongolian variety, the head is of a square form, with the forehead low and slanting. The orbits are large and open, and the superciliary arches elevated.

In the Ethiopian variety, the front of the head is

laterally compressed and elongated, so that the length of the whole scull from the teeth to the occiput is considerable. It forms a complete contrast to the globular head of some Europeans, and to the square heads of the Calmucks. The forehead is wonderfully narrowed off, and the face widened below, the foramen magnum is large and farther back, and the apertures for the nerves are larger. The organs of sense are more developed, and the narrow forehead and protruded muzzle give to the negro head a character decidedly animal.

The American scull may be thus characterised—broad cheek-bones, depressed forehead, deep orbits and nasal cavity generally large.

The Esquimaux and Greenlanders who seem to form a link between the Americans and Mongolians, have broad cheek-bones, and large jaws and face, flattened nose, the cranium sufficiently ample, but distinguished by a posterior elongation.

The Carib tribes are conspicuous for a most remarkable depression of the forehead, which defect they increase by artificial means. The hinder parts of the scull greatly preponderate: the face is large and muscular. The nasal bones neither small nor flat. The nasal cavity is large, and the jaws and teeth display great strength.

In the Malay variety, the scull is narrow at the anterior and upper part. The face is large and the jaws prominent.

The reader having satisfied himself that there are national varieties of heads, let him direct his attention to those of his own nation—to those that surround him. Let him more particularly observe the heads of different

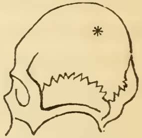
families, and after he has familiarized his mind with such diversities of form, he will then be prepared to observe and distinguish the peculiarities of form that appertain to the heads of members of the same family ; for amidst the family resemblances which always more or less exist, he will uniformly find decided and palpable differences.

The following six outlines of the sculls of as many different tribes and nations, even though in profile and on so small a scale, will enable the reader to form some idea of the differences of form that exist in sculls of different nations :—

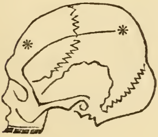
1.—*New Hollander.*



2.—*North American Indian.*



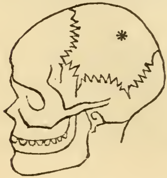
3.—*New Zealander.*



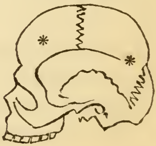
4.—*Ancient Greek.*



5.—*Well Formed Negro.*



6.—*European.*



It is generally admitted, that a great diversity of intellectual and moral character exists among men. The varieties of character are, indeed, infinite ; and this being admitted, how are we to account for this variety ? Is it to be attributed to education—to climate—to forms of government—or to food ? Each and all of these causes have been assigned, but they are obviously quite inadequate to produce the effect. Take a small community of children, a boarding school for example, in any part of the country or world, and observe, if similarity of government, education, climate, and food will reduce the inmates to a uniformity of character. It is of no moment how soon the training commences, or how long it is continued, uniformity cannot thus be effected, and every teacher of youth knows this and will admit it. If these causes, acting as equally as possible on a limited number of individuals, cannot produce a uniformity, what reason have we to suppose that they could produce such an effect upon a greater number, or upon the whole of mankind ? or what reason have we to imagine that the diversity of character, that undoubtedly exists among men should arise from the *unequal* operation of these causes. In attributing the diversity of human character, to these comparatively adventitious circumstances, philosophers have looked too far from themselves. They have erred like children, who, when sailing along the banks of a river, see houses and trees in motion, and never dream that the motion is nearer themselves, or like the astronomers of old, who beheld in the rising and setting of the sun, a diurnal rotation of the whole universe, never for a moment suspecting that the motion of the earth upon its

own axis, would explain simply and perfectly all the phenomena. Man has within himself the elements of an infinite diversity of character. Admit that the character of man depends upon his brain, and the diversity of character can easily be accounted for. The form, size, and internal constitution of the brain vary *ad infinitum* among men, and these modifications of structure necessarily impart corresponding modifications of function. Throughout nature the most stupendous effects are produced by simple means. By the operations of the law of gravity, millions of worlds are preserved in their proper relative situation and their motions through space maintained with mathematical exactitude and regularity. It argues strongly in favour of phrenology, that it can explain so simply the diversities of human character that are admitted to exist, and on a principle to which, if we admit the brain to be the organ of the mind, no rational or solid objection can be made.

CHAPTER IV.

On Insanity.—Proximate Cause corporeal.—Corporeal Agents produce it.—Insanity hereditary.—Different Kinds of Insanity.—Principles of Treatment.

If Phrenology is true it should explain the phenomena of mind both in a state of health and disease. Now, it is well known, that it can afford this explanation. Insanity in all its forms is dependent on a peculiar condition of the brain. If insanity is a disease of the mind itself, as many suppose, then

Phrenology has no foundation in nature; or if it be attributable to the direct influence of demons, as was long believed and inculcated, then Phrenology is little better than a dream, and medical science necessarily as inefficacious in the treatment of such disease as the divining rod of the enchanter. But to obviate such conclusions—such absurdities, we should say—it is only necessary to show that insanity in all its forms is dependent on certain corporeal states—that insanity is a corporeal disease, and may be curable or incurable according to the circumstances of the case, like every other corporeal disorder. It is scarcely possible to form an idea of a disease purely intellectual. Every disease with which we are acquainted depends upon some structural derangement of the organ affected. There is no disease purely functional. The function of an organ depends altogether on the structure; and to speak of the function of an organ being affected without a previous change of some kind in the structure, is fraught with the greatest absurdity:—it is to contend that the function may exist without the structure; or, in other words, that an effect may exist without its cause. Now, in diseases of the mind, is the structure of the mind affected? is there any thing that can be called structure in the mind? has the mind parts and proportions? For, unless it has parts to be affected, how could a disease exist? Many who speak of a disease of the mind, contend also for the mind's ethereality and indestructibility? but are not the two opinions obviously at variance? If the mind is liable to disease it is also liable to die; and are all those who contend for the existence of mental disease, pre-

pared to impugn the consoling doctrine of the soul's immortality? Phrenologists, at least, do not acquiesce in such a proposition. Phrenologists maintain that in insanity, the corporeal instrument of the mind alone is affected: and they conceive, that what may be predicated of the organ is not necessarily applicable to the agent that uses the organ.

That insanity is a corporal disease may be deduced from the following considerations:—first, agents that produce their effects upon the body only, produce it. Every thing that affects the organization of the brain, either directly or indirectly, influences the manifestation of the mind; a blow which depresses a portion of the scull annihilates for a time the power of thinking, and the elevation of the broken piece of cranium restores the mind to its wonted powers; inflammation of the brain is uniformly attended with delirium, and with the removal of the inflammation the delirium ceases; insanity may also be induced by the improper use of intoxicating liquors; aliments and drinks have an influence on the morals—many medicines have the same effects: now, do not these agents act only on the body; do aliments or medicines act on the mind? No; they act only on the corporeal organization, and hence those peculiar states of the mind that are induced are dependent on the corporeal condition.

Secondly. Insanity is an hereditary disease. The hereditary nature of insanity is a fact so obvious and generally admitted, as scarcely to require either illustration or proof. If proof were demanded, I would refer not only to the opinion of mankind generally, but to men whose days and nights have been devoted

to the investigation of the disease, and who are unanimously of opinion that it may be transmitted from generation to generation. In corroboration of this view Haslam relates ten cases, to one only of which we shall at present advert. In detailing the history of an inmate of a madhouse, he says, that the patient's grandfather was mad, but that there was no insanity in his grandmother's family. The father of the patient was occasionally melancholic, and had one raving paroxysm—his mother's family were sane. The same patient had a brother and five sisters—now, mark the effect of the disease upon them : his brother, Haslam says, has been confined in a madhouse, and all his sisters have been insane—with the three youngest the disease came on at parturition. It is also well known that the longer insanity has existed in any family, and the greater the number of generations that have been affected, the more liable is the disease to appear. Foderé has observed, that among Cretins children of the first generation are only a little disposed to the disease, but if such children intermarry with other Cretins, it appears much more frequently ; and if three generations of such children consecutively intermarry, the disease, he says, is a certain and inevitable event. In the same proportion, he informs us, the probability of hereditary insanity lessens by intermarrying successively with healthy persons. These are facts with which all are familiar ; but if they prove any thing they prove the corporeal nature of the disease in question. They cannot be explained by referring the disease to the mind itself ; for, is the immaterial and immortal existence we denominate mind transmitted by

generation? if we are not assured on this point, we cannot be certain that peculiarities of mind can be so transmitted. It is an incontestable fact, however, that corporeal peculiarities may be transmitted by generation. Gout, scrofula, phthisis, apoplexy, are hereditary diseases ; the stomach, heart, lungs, liver, brain, and every other organ, participate of inheritance. We can distinguish family brains as well as family feet, family hands, and family faces ; and when peculiarities of talent and disposition display themselves in certain families, and are transmitted from father to son through a series of generations, is it not more just and philosophical to ascribe these to the peculiarities of the corporeal organs which can undoubtedly be transmitted, than to some peculiarities of the intellectual principle with the nature of which we are totally ignorant? But it is not by reasoning only that we deduce the corporeal nature of insanity. We see it arising from causes which produce other corporeal complaints, and presenting symptoms which every one must admit have a reference to corporeal organs only. These symptoms are headach, pain over the eyes, stricture and numbness across the forehead, dizziness, noise in the ears, and dilatation or contraction of the *pupils* of the eye ; symptoms which, though no other existed, would lead every medical man to suspect a morbid condition of the brain ; and, after death, is that condition not found? Were we to answer this question simply in the affirmative, or bid you rely upon the authority of some eminent phrenologist whose opinion we could cite, you might be inclined to receive the enunciation with that distrust which any *ex parte* statement naturally carries

along with it. But to place the subject most impartially before you, we would refer to the work of Dr. Abercromby on the diseases of the brain—one of the latest and ablest works upon the subject. Dr. Abercromby is no phrenologist, yet his work is calculated to do Phrenology some service. The dissection of 133 cases is given in that work ; and, with the exception of two or three obscure cases from which no conclusion can be drawn, they lead irresistibly to the conclusion, that disease of the brain is uniformly attended with mental alienation, and mental alienation with cerebral disease. In all these cases, the cerebral disease and mental affection hold the relationship of cause and effect ; and were our experience on this subject greater than it is, we could infer from the state of the mind the precise state or condition of the cerebral organ.

From reasoning and observation, then, the proximate cause of insanity must be considered as corporeal. The mind, in this state, is no more diseased than in the derangement of the five senses or of the organs of voluntary motion. In all diseases of the organs of sensation, the proximate cause is not looked for beyond the corporeal organs. In palsy, cramp, tetanus, &c., the cause is not looked for in the mind, but in the instruments by which the will is propagated and voluntary motion produced. Ought we not to reason in the same manner regarding the internal organs ? Indeed, too much attention has been paid to the moral and metaphysical causes of insanity ; while the corporeal, unquestionably more within the sphere of our observation and comprehension, have been overlooked—almost totally neglected. If insanity is a disease purely men-

tal, it should be cured by reasoning; but will ratiocination effect a cure? If so, why should medical men interfere? Should not the insane rather be intrusted to the divine and metaphysician as formerly; but who would be so foolish as trust a serious case of insanity to this mode of treatment? "The good effects," says Haslam, whose practical knowledge of insanity was very extensive, "the good effects which have resulted from exhibiting logic as a remedy for madness, must be sufficiently known to every one who has conversed with insane persons, and must be considered as time lost." In opposition to these views, it has been urged that insanity may be cured by *moral* treatment alone; and if this be admitted, how can the fact be reconciled with the corporeal nature of the disease. It must indeed be admitted that the *soothing* plan of treatment, which is the medical name for the *moral,* is often highly efficacious, and is now, we are happy to find, the method of treatment usually adopted in this country. But this concession does not overturn the fact of the corporeal nature of insanity, for the moral treatment is beneficial in almost every corporeal disease. Many diseases of the heart are cured by this plan alone. In inflammation of the eye, we exclude the light from the inflamed organ, we keep the patient on low diet, and avoid every cause of excitement, and the inflammation may be overcome; but is the disease not seated in a corporeal organ? In inflammation of the brain, the moral, or soothing plan, is uniformly had recourse to; but because the inflammation may subside by these means, are we to conclude that inflammation of the brain is not a corporeal dis-

case? Now, insanity is a *symptom* of a diseased condition of the brain, depending primarily, in the majority of cases, on a greater or less degree of inflammatory action; it cannot be surprising then, that a plan of treatment which wards off from the diseased organ every species of excitement, should be productive of beneficial consequences. It would be surprising indeed, were it otherwise. Enter into any of our best conducted hospitals for the insane, and after attending to the practice most successfully employed, say whether it accords or not with the corporeal nature of the disease. Will you find the patient bound hand and foot and thrown into a dungeon till his senses return, or chained to a stake and lashed into a sense of duty or obedience to his merciless overseer? No; you will find the patient treated upon different principles; you will find leeches applied to his temples, his head shaved and covered with a blister, the secretions of his bowels improved by appropriate alteratives, his nervous system soothed by hyoscyamus, opium, and other anodynes, and the wants and comforts of the patient attended to, so far as may be consistent with his general safety. This plan of treatment is applicable only to a corporeal disease; it presupposes an affection of the head, a disease of the brain; and it would be more philosophical, in speaking of insanity, to call it a disease of the brain, than to use an appellation which is so liable to mislead, and which at best indicates but one symptom of the morbid affection. Had insanity always been denominated a disease of the brain, or been viewed as of this character, would the heart-rending scenes which at one time were of daily

occurrence in every madhouse, ever have been witnessed? or, when entering these abodes of wretchedness, would human ears ever have been assailed by the clanking of chains, the resounding lash of the whip, and the reiterated yells of the miserable outcasts, writhing under a blind but systematic medical torture? Had the grand fundamental principle of Phrenology been known, that the brain is the material organ of the mind, a man could no more have been scourged or mutilated for being insane, than for labouring under diarrhœa or dysentery; he would have been viewed only as an object of deep commiseration, and means resorted to with some rational prospect of benefit. The knowledge of a disease is admitted to be half its cure; and if we can point out the seat even of any obscure disease, we have made an important advance to its successful treatment.

It may be urged that medical science is not indebted to Phrenology for this view of the nature and treatment of insanity. If such views, however, existed before the introduction of Phrenology, they had little influence on medical practice. In none of our standard medical authorities is it decidedly stated that the brain is the organ of the mind. It is only since Phrenology was promulgated, and a force of evidence produced which bore down all opposition, that the position has been generally admitted. But Phrenology has not only led us to seek for the cause of insanity, where alone it is to be found—in the corporeal organs—it has also enabled us to explain the endless variety of phases through which it passes, and modifications which it assumes. How curious, and, according to the old

philosophy, how perplexing, are some of the symptoms of insanity! A person, for example, may be insane on one subject or one set of subjects, and perfectly rational on every thing else; and some idiots even exhibit remarkable talents in a particular way. "By an inexplicable singularity," says Foderé, "some of these individuals (Cretins) endowed with so weak minds, are born with a peculiar talent for copying paintings, for rhyming, or for music." He knew several, he says, "who taught themselves passably to play on the organ and harpsichord, others who understood, without ever having had a master, the repairing of watches, and the construction of some pieces of mechanism." He adds, "that these powers could not be attributed to the intellect, for the individuals not only could not read books, but could not comprehend what was said to them." A man may be insane on love, or religion, or on as many different subjects as there are primitive powers of the mind.

It has been already stated that insanity is not a disease, but a *symptom* of a disease, or of numerous diseases, and a symptom which can only be removed by taking away the pathological cause inducing it; or, in other words, by changing the state of the brain on which it depends. Insanity bears the same relation to the brain that irregularity of pulse bears to the heart, and as a deranged condition of the pulse cannot be cured without removing the disease from the heart, neither can mental manifestation be improved without a change of the state of the brain. These phrenological views of the subject may be illustrated still farther by comparing insanity to a central point, from

which lines diverge in every direction ; all the lines have this in common, that they communicate with the central point, but each line has also a separate and independent existence. If one line alone be affected, the disease would correspond with partial insanity, but if all the lines be affected it would correspond with complete insanity ; the mental phenomena could thus easily be supposed to vary with the lines affected. Substitute *organs* for *lines,* and a perfect idea may be formed of the phrenological doctrine of insanity. When one of the organs of the brain is affected with disease, the insanity is partial, and the degree of insanity will depend on the number of organs affected. From this view of insanity, how easily it enables us to explain every attendant phenomenon, and what a power Phrenology is capable of imparting in the discovery and treatment of cerebral diseases. *

* The following cases will illustrate still farther the connexion between insanity and disease of the brain :—

Dr. Haslam repeatedly asserts, that insanity is always connected with a morbid condition of the brain.

Greding has noticed thickening of the skull in 167 out of 216, besides other morbid states.

Spurzheim says, that disease of the head always exists in insanity.

M. Georget, after numerous dissections of the brains of insane persons, arrives at the same conclusion.—*Medico-Chirurgical Review*, 1827.

Mr. Davidson examined with great care, the heads of 200 patients who died in the Lancaster County Lunatic Asylum, and he says that scarcely a single instance presented itself, in which traces of disease in the brain or its membranes were not evident even when lunacy was recent, and the patient died of a different disease.—*Observations on Mental Derangement, by Andrew Combe.*

Dr. Wright of the Bethlem Lunatic Hospital informs us, that he examined the heads of 100 patients who died of insanity, in 90 of which disease was most palpable, and though less marked in the remaining ten, yet he discovered disease in some form or other.—*Medico-Chirurgical Review*, 1828.

CHAPTER VII.

ON THE PRINCIPLES OF EDUCATION.

Principle 1st. Education does not confer new powers either mental or corporeal, but merely improves those already implanted by nature.

2d. All the powers of the mind cannot be improved to an equal degree in any individual.

3d. The improvement of any one power of the mind does not affect the strength or energy of any of the other mental powers.

4th. The intellectual powers which are naturally strongest in any individual should be cultivated to a greater degree than those that are weak.

5th. Education to be effective must be practical.

Advantages of Phrenology.

I. There is no living being with which we are acquainted susceptible of education to the same extent

A competitor for the prize offered by Esquirol for the best essay on insanity, states that he examined the heads of more than one hundred individuals who died insane, and arrives at the following conclusions: 1st, That in the brains of those who die insane, changes of structure will always be found. 2d, That these changes are the consequences of inflammation, either acute or chronic. 3d, That there exists a correspondence between the symptoms and the organic changes, and that the names, monomania, mania, &c., ought to be employed as representing degrees and stages of inflammation of the brain.—*Archives Generales de Médicine.*

Although these are important facts, and argue strongly in support of the conclusion we are advocating, still it must be admitted, that cases of insanity have existed, in which no trace of cerebral disease was *found* after death. Too much has been made of such cases by some physiologists. The simple explanation I conceive to be, that the structural disease eluded observation; and who can say that a slight change in the molecules of the brain—a change inappreciable by our senses—will not affect materially the function of the organ. It is often

as man, and the reason of this is found in the great superiority of man's natural endowments; for education, it is to be particularly remarked, does not confer new powers, either mental or corporeal, but simply improves

extremely difficult to detect the existence of disease in nervous matter of any kind, yet in many instances we are bound to believe that disease exists, although the structure is not obviously affected. In amaurosis, or "serene drop," we cannot doubt that the nerve of vision is in a morbid state, although it may appear of as natural a structure as in the healthy eye. In some instances of this disease, the slightest opacity of the retina is often all that can be detected; and in other instances, the change of structure is so slight, as to elude completely our present means of detection.

Pinel, Calmeil, Grandchamps, Bayle, Foville, and Falret, have investigated the anatomical characters of insanity with great care, and under the following threefold aspect:—1st, Whether organic lesions exist in insanity. 2dly, What are those lesions? and 3dly, Do they vary?

Their answers to the first question are quite decided: they agree that in all cases there are lesions. In their answers to the second they assert, that these lesions are to be found chiefly in the brain, or its membranes; and in the third place, that the lesions differ in their nature, seat, and extent.

Monsieur Foville says, that when the intellectual faculties are alone affected, the grey of some part is diseased; and that when the intellectual disturbance has been acute, the cortical part presents a redness similar to erysipelas, and that this redness is uniform or not, more or less diffused, or more or less superficial. Sometimes the cerebral substance is found to have lost its consistency, while at other times it is preternaturally solid and firm.

When the disease is *chronic*, a different set of morbid characters according to the same authority, are found. The seat is the same, but the affected portion he says, is divided into two layers, one superficial, discoloured, indurated, and raised like a membrane, and the other which lies immediately beneath this, presents a rugose and granular appearance.

In some cases, the cortical substance is softened and separated from the white; in others, the convolutions are partially or generally wasted and occasionally cysts are formed where the atrophy has occurred.—*See Andral on Diseases of the Nervous System, Medical Gazette*, Vol. xviii. p. 812.

those already implanted by nature ; this position. though to us perfectly obvious and incontrovertible, is not generally admitted. It will be necessary, therefore, that we enter upon its full examination, and that the subject may be placed in as strong a light as possible, we shall refer first to the effects of education upon the *Vegetable Tribes;* secondly, upon the *Inferior Animals;* and thirdly, upon *Man.*

In what, we would ask, does the education or culture of a plant consist ? Is it not in imparting to it its proper nourishment, in placing it in the most favourable circumstances for appropriating the nourishment imparted, and in obviating those external causes which tend to its injury ? By attending to these circumstances the plant will grow, bear fruit, and display in full vigour the energies of its nature ; but you can force it to do no more. You cannot by any mode of culture change the nature of a plant. No mode of culture could, for example, convert a plum-tree into an apple-tree, or make the poppy, which secretes opium, distil the juice of the grape. Culture can produce no such changes on vegetables ; it may give addition of size ; it may modify or heighten the fragrancy or savour of the vegetable or its productions, but cannot alter the intrinsic character of any individual vegetable substance.

In the education of *inferior animals*, in the next place, the same principle applies. We may affect or modify the character of such animals by education, but we cannot change their natures. We cannot, for example, impart the dispositions of a carnivorous animal, to that of a herbivorous, or *vice versa.* We can tame, no doubt, the most furious of animals, but this training

does not impart any new power, but merely decreases or strengthens, modifies or changes, the direction of powers which previously existed. The taming of a wild animal is effected by exciting in the first place its fears, so that it may be completely overawed, for without this no subsequent step in the treatment could be availing. After the trainer has imparted a sense of his invincible superiority upon the animal by a frequent recurrence to such means as are found adequate to the purpose, his next step consists in repressing and keeping in a state of quiescence, those natural instincts and dispositions which have a tendency to show themselves; which may be effected, partly by keeping the animal in a state of due subordination, and partly by excluding those circumstances which can excite the dispositions we wish to overcome ; and lastly, he must excite and keep in constant activity, those kindly feelings which exist to a certain extent in all animals, and which show themselves occasionally in their most furious state. It is an undoubted fact, that in the inferior animals, as well as in man, propensity of every kind is increased by exercise and weakened by disuse ; so that even in the lion, if we could lull for a great length of time those passions which naturally agitate and convulse his frame, we would insensibly rob the animal of his furious nature, and assimilate it to other animals less furious and consequently more manageable and docile, but do we by these means change his inherent dispositions? Is the mild and inoffensive lion that has been encaged for years and subjected to the mastering hand of man, a totally different being from him who ranges in the forest in all his shaggy

terrors, and appals by his thunders the animal world around him? The one is educated as far, it may be, as his nature will permit; but the animal has received no new instinct, and all its old are still lurking within it, and liable to break forth by the operation of every exciting cause.

In taming or educating an animal of an opposite character from the lion, a hare, for example, though we must proceed upon similar principles, yet the application of these principles must vary with the natural character of the animal; as timidity in the hare is the overwhelming feeling, great care would be necessary to diminish its intensity, for till this was accomplished the education of the creature could not be proceeded with; but strong though the feeling be in that animal, it may, to a great extent, be overcome; the intensity of every animal feeling is increased by circumstances which excite the feeling, and weakened by what represses and keeps it in a state of inactivity. In the example referred to, the timidity would be diminished by placing the animal for a long time in situations where it could suffer no injury, and at the same time experience frequent acts of kindness; it is in this way only that the feeling of timidity in an animal would be partially overcome.

But in the training of animals it may be said that more can be effected than the weakening or softening down of certain feelings; we can teach them something positive; we can make them learn what is foreign to their natures; we can impart, in a word, new dispositions and powers. Can we not, for example, train a dog to discover game without injuring

or devouring it, and thus to act contrary to the impulse of its nature? Can we not impart the elegant accomplishment of dancing to bears and horses, and can we not teach parrots, starlings, and magpies to speak, and is not speech admitted by philosophers to be the prerogative and glory of the human race? These allegations may seem to demand some explanation. In training a dog for a particular purpose we have, in the first place, to accommodate ourselves to the particular instincts and dispositions, as well as the inherent sagacity of the animal we wish to train. A bull-dog, for example, could not be trained to the duties of the shepherd's dog, nor a greyhound to those of the setter or pointer. We can easily train any dog to perform a certain set of acts, but how comes it that all dogs cannot be trained equally to the same pursuits? If the education of dogs consisted in imparting to them new instincts or corporeal powers, all surely could be taught to the same degree, for every thing would depend on the trainer,the reception of the power not being dependent, in any degree, on the animal; it must, according to the supposition, come from the trainer; nay, if the supposition was correct, a sheep or any other animal might be raised to the same degree of sagacity and usefulness as the shepherd's dog, an idea not only inconsistent with all experience, but manifestly absurd. That dogs, bears, and horses may be made to dance, to a limited extent, is unquestionable; but this attainment is not the result of the superaddition of any power. either corporeal or mental. Dancing essentially consists in moving the feet in a particular manner, but all these animals could move their feet as soon as they

were brought into the world; and the young foal frisking around its dam in the pasture field displays more varied and elegant movements than all the more measured steps of the circus dancing-horse. The one is like a finished gallopade, while the other is a miserable caricature of something like the *Highland Fling*. It is particularly obvious, therefore, that in teaching a horse to move his limbs in a particular manner, we confer no new power upon the animal, we only give a new direction to a power which formerly existed. But this remark cannot surely apply to speech. No inferior animal in its natural state speaks, but by education can we not make them display this power? and if so, the power is capable of being imparted; and if any new power can be imparted by education, the argument we are attempting to support must fall to the ground. But we are prepared to show that no animal but man can, in the proper acceptation of the term, be taught to speak. Parrots, starlings, magpies, and a few other animals, *imitate*, indeed, a certain limited number of articulated sounds; but this is not speech. Before a being can be said to speak, it must comprehend the meaning of the words it uses. But do these animals know the import of any word, or have we the means of imparting the necessary intelligence to them? We undoubtedly have not. So long as the intelligence is awanting, they cannot, upon any sound principle, be said to speak; for speech is essentially the communication of ideas, and the articulate sounds we use are merely the signs or symbols of these ideas. The signs are nothing in themselves, it is the ideas we are taught to associate with them gives them value; but as in the

inferior animals there is no perceptible relationship between the *sign* they may be taught to use, and the *thing signified*, there can be no speech. In educating the inferior animals, we must first study their *inherent* dispositions and improve them, and turn them to the purposes we may require. If we proceed upon the principle of imparting *new powers*, either corporeal or instinctive, our efforts will be unavailing : nature cannot be changed.

If these observations are applicable to the inferior animals over which we have such unlimited power, we may draw the same conclusions regarding the education of *man*. Many men who have received the best education which influence and money could procure, have after all, remained consummate fools ; and many who have had little or no assistance, have by the sheer force of their genius astonished mankind by their powers. Shakspeare, Burns, Mozart, and many others that could be mentioned, are of this last description. If education is every thing in eliciting the powers of the mind, as some have supposed, why are not all educated individuals as great in poetry as Shakspeare ? and why are all men not equal in mental power and mental acquirements ? Is the difference which unquestionably exists, attributable to the difference of degree in the education of individuals ? Are the talents of men found to bear a uniform relationship to the ratio of their education ? Do members of the same family, who are educated as nearly as possible in the same manner, and to an equal degree, never display diversities of mental power ? and if they do differ in mental capacities, to what is this attributable ?

It cannot be to education, but to something in themselves.

In every department of nature, variety is the predominant characteristic. In the grass that covers the face of the globe, two *blades* cannot be found perfectly alike. Two objects in nature have never been in this state, and what reason have we to think that the *mind* is an exception to this law? Do not the varieties of mental conformation continually force themselves upon our observation. These varieties are found at the moment of birth as well as at death. It is evidently an ordinance of nature. No circumstance with which we are acquainted, can produce an equality. An equality of corporeal stature and strength might as reasonably be expected.

Is education then of no use to man? Far from it. Although education cannot do every thing, it can effect much. Man possesses a greater number of inherent moral and intellectual powers than any other animal; all these powers are susceptible of improvement, and it is the object of education to give a proper direction to these powers, and to raise the moral and intellectual status of the individual to the highest point of which his nature is capable. If the intellectual powers, however, are naturally very weak, no education can render them strong; and if they have been naturally very strong they will remain so even without education. Education can *improve* the powers of man, but not to an indefinite extent. The man who has naturally a weak verbal memory, may improve it by education, but never to the extent of an individual who has that power naturally strong. If the reflecting

powers of an individual are naturally weak, no system of training can render that individual pre-eminent in metaphysical or abstract speculation. By education his powers will be improved, but under no circumstances could he be made to equal a Locke, a Newton, or a Bacon.

It is painful to observe the absurd and contradictory opinions entertained by men who have pretensions to the character of philosophers, regarding the mind and the effects of education upon it. One compares the human mind in its natural state to an uncultivated field, and education to the ploughing or preparing of it for the seed; another compares education both to the ploughing of the field and sowing of the seed; while a third likens the human mind to a garden full of weeds, and education to the uprooting of the noxious productions. Were we permitted to speak metaphorically on the subject, we would say that the human mind is a garden full of natural plants; and that although education consists in the cultivation of these plants, yet it must be remembered, that the cultivation of one plant does not affect the luxuriancy or growth of any other. Or we would rise higher in the regions of metaphor, and compare the human mind to a diamond which, in the natural state, might be mistaken for a common mineral, but from which the hand of the artist, like the efforts of the teacher, can remove asperities, and draw forth latent and resplendent excellencies. What polishing does to the diamond, education effects upon the mind, but no more; it draws out and improves talents; it polishes, but never changes the inherent character of man. It

may be considered, therefore, an incontrovertible axiom in philosophy, that education cannot impart new powers, but can only improve, and that to a limited degree, the powers originally conferred by nature.

II. All the powers of the mind cannot be improved to an equal extent in any individual.

This position is not only a natural conclusion drawn from our knowledge of the mental constitution of man as indicated by Phrenology, but is also supported by daily experience. It is an incontrovertible fact, that individuals experience great difficulty in acquiring some kinds of knowledge, while in other departments of literature or science, they make rapid progress; they feel instantly at home, and experience in such studies nothing but delight. But even admitting that man is born with all the mental powers equally strong, which is not the fact; to preserve them all in an equal degree of strength, the same degree of exercise or culture would require to be given them all; but the smallest consideration will lead to the conclusion that this is impracticable. Who has the requisite time or corporeal strength even for such a species of training? To train one power to the highest degree of which it is susceptible, our undivided attention is often required; but how could undivided attention be given to one power if all the other powers of the mind must be attended to in an equal degree? Suppose you wish to cultivate that power of the mind we call number or calculation. If you devote your attention exclusively to arithmetical or algebraical subjects you would attain greater eminence in these departments of science, and improve the mental power on which that

eminence depends, than if we were to attempt to cultivate also the fourteen remaining intellectual powers. If these observations are well founded, we ought not to attempt to cultivate all the powers of the mind to an equal degree, and any system of education founded on such a principle will lead to nothing but disappointment.

III. The improvement of any one power of the mind, does not increase the strength or energy of any other mental power.

This principle of education flows directly from the phrenological doctrine, that the mind displays its powers through different organs, each organ being susceptible of action and repose independently of the others. The common opinion seems to be at variance however with the above position. A boy sent to school to cultivate his mind, is first taught to read his native language. After he has attained a knowledge of this indispensable preliminary, he is sent, it may be, to the grammar school, where he consumes four or five years in learning the meaning of a few Latin or Greek words; he has now got what is called a grammar-school education; in the estimation of some he is an educated boy; and his friends suppose, that because he understands a few words of Latin and Greek, his mind is cultivated —he is fit for every thing. But this training is calculated to cultivate only one of the powers of the mind, the power which phrenologists call *Language;* and to show that the other powers are not improved by such a course of training, we have only to observe the effects of this training on the general character of those who are subjected to it. Do we not every day

observe young men who have uniformly stood foremost among their fellow-students, both at schools and colleges,—who have shown the greatest aptitude in learning languages,—who have even displayed great philological powers, and whose mind, so far as Philology is concerned, may be said to have received the last polish from the hand of the artist,—have yet, in the ordinary affairs of life, and in other departments of science, displayed the greatest imbecility? We do not wish to disparage philological attainments—for the successful cultivation of some professional pursuits they are indispensable; but their importance ought not to be over-estimated. And those who believe that in learning the meaning of words all the powers of the mind are cultivated, over-estimate the advantages of cultivating a verbal memory, and fall, besides, into a most pernicious error. Do the best philological scholars make the best arithmeticians, musicians, or artists? Or do they explore, with equal success, the facts and abstractions of physical and metaphysical science? They do not. Among these departments of art or science, there is nothing alike: for their successful cultivation, therefore, other powers of the mind are required; and it would be as absurd to suppose that a training up of one power would strengthen or affect any other power, as it would be to imagine, by improving the organ of touch or taste, we must necessarily render more acute the organ of hearing.

IV. The intellectual powers which are naturally strongest in any individual, should be cultivated to a greater degree than those which are weak.

If man could cultivate all his powers to the highest de-

gree of which they are capable, and all to an equal extent, the very reverse of this proposition ought to be our rule of practice; but so long as the various intellectual powers of the same mind confessedly differ in power, it would obviously be absurd to endeavour to reduce them to one standard; we could only effect our purpose by weakening the stronger powers, and would thus necessarily lower the intellectual status of the individual. The majority of mankind display partial talents, or talents of a particular kind only. Some display a single talent only; and though great in reference to that talent are weak and imbecile in regard to every thing else. The character of the man is generally estimated from his most predominating talent; and if that talent exist to an extraordinary degree, he may be viewed as a prodigy among his fellow-men. Did we, however, reduce in such a case all the powers of the individual to an equality, as we cannot raise the lower powers to an equality with the higher, we would necessarily reduce the higher to an equality with the lower, thus obviously lessening the value of the whole character; and any system of education founded on such a principle must deteriorate, but cannot exalt the character either of individuals or nations. Look at the blasting effects of the application of this equalizing principle on the state of India. By the institution of the *castes*, every individual must follow after the occupation or profession of his forefathers. Taste and talent are there never consulted; these are made to bend to external circumstances; genius is consequently cramped; industry paralyzed; every motive to individual and national improvement withdrawn; and a soporific mixture thrown, as it were,

upon the intellectual activities of the community. Let, however, the institution of *castes* be demolished ; let the arbitrary restrictions that press down that immense population to the dust be taken away ; let the talents of every man have free scope, and we shall soon find the character of the whole people improved ; genius asserting its natural and inalienable superiority, and shedding a refinement and glory over an amiable, though benighted people. In this country it is far otherwise : all are free, the lowly peasant equally with the high-born prince can follow the bent of his genius ; and where talent or genius shows itself, it is certain of encouragement.

As man cannot cultivate all his powers equally, it is surely better that he should cultivate those which he can turn to some account, than by unavailing efforts endeavour to excel in something for which he was never designed by nature. How ridiculous it would be for an individual paralytic in the lower limbs to choose the profession of dancing ; but would it not be equally absurd for an individual destitute of musical talent, to follow music as a profession ; or an individual who could not discriminate colours, to wed himself to the profession of painting. When talent is naturally weak, it may by cultivation be rendered stronger ; but no education can compensate it for natural deficiencies ; and hence when any power of the mind is very weak, the cultivation of the power will never lead to any satisfactory result, and time will be lost in the effort, which might have been beneficially employed in training some of the other powers more susceptible of improvement. As no human being can excel in

every thing, why should not every one confine his attention to that department of art or science most congenial to his nature? But how are we to discover the talents or genius of the individual? In two ways, First, In observing the natural bias or inclination of the individual; and, secondly, by following the light which Phrenology throws so broadly and steadily upon the subject. Many will acquiesce in the justness of the first of these observations, who would smile at the idea of determining the profession of an individual by the form of his head; but to those who have studied phrenological science, there is in such a position nothing either unphilosophical or impracticable.

If it be admitted that the brain is the only part of the body through which mind is displayed—and the position cannot be disputed, it is a fact on which all physiologists agree;—if it is admitted, then, that the brain is the organ of the mind, it must also be admitted, that any modification of the organ will affect the mental manifestation. A similar observation applies to every other organ of the body, and we have yet to learn that the brain is an exception to the general law. Now, size and form are important modifications which affect the functions of every organ; and why should we imagine that these modifications can have no effect upon the functions of the brain? We know that they have a most decided effect; and Phrenology tells us what these effects are. Supposing, in the next place, that those who display particular talents are remarkable for particular cerebral conformations, is it absurd to suppose that such conformations could be recognized, and the talents coexistent with

the conformations predicated? If this view of the case be objected to, then we are entitled to ask, what is the cause of the mental imbecility in the heads of idiots or new-born children? Is it attributable or not to the state of the brain? Can a case be adduced with decided idiotic conformation, in which the intellectual powers have been displayed even in a moderate degree? No such case is to be found—the thing is physically impossible. You might as well expect the imperfect eye of the mole to equal in visual power the keen and piercing eye of the eagle. No human being with such a brain can be intelligent. We have at least never seen such a phenomenon, and what reason have we to believe in the possibility of such an occurrence! But does it not follow, that if the form of the head which appertains to the majority of idiots can affect the mental manifestations, other conformations must produce other effects? and is it absurd to suppose that these effects could be ascertained? It is now generally admitted, that the brain at the forehead is the seat of the intellectual operations; and if this opinion be well founded, is it not obvious that a small development of forehead must be incompatible with intellectual greatness, else what is the use of the brain at all? It is now also admitted, that a large development of the posterior and lateral parts of the brain may exist with a small anterior development; and that as the intellectual power corresponds with the magnitude of the forehead only, the lateral and posterior parts of the brain cannot be concerned in the manifestation of the intellectual powers. Now, Phrenologists assert that observation leads them not only to

the conclusion that the mental feelings and intellectual powers occupy different divisions of the brain, but they maintain, likewise, that observation has enabled them to condescend on the precise parts of the brain which are the seats of the different feelings and intellectual powers. Now, suppose you wish to test the truth of these observations you must appeal to nature, and observe particularly whether the power is ever seen without the development, or if this mode of experiment appears unsatisfactory, you will find that the power may be predicated from any given development. *

* In corroboration of the above statement, the following documents, though a little out of place, will be perused with interest :—

From George Salmond, Esq., Procurator Fiscal of Lanarkshire; Walter Moir, Esq., Sheriff Substitute of Lanarkshire; and Mr. D. M'Coll, Governor of Glasgow Jail.

To George Combe, Esq.

Sheriff's Chambers,
Glasgow, 22*d April*, 1836.

Dear Sir,

A few days ago Sheriff Moir having told me of your intention to examine phrenologically some of the criminals in Glasgow jail, I expressed a wish to be present, in order that I might have a practical test of the system, and ascertain whether your inferences of character should accord with what was privately and officially known of them by myself; and Mr. Moir having kindly honoured me with an introduction to you, I had the gratification of attending your examination of a number of these persons, and of hearing with sincere interest the accurate conclusions you arrived at on each of them.

Never before having witnessed such an operation, and expecting that, after a tedious process of examination, taking notes, and comparing and calculating results, something of an oracular generality of character should be announced, I was very much pleased to observe, that while your examination of each did not average a minute, you instantly, and without hesitation, stated the character, not generally, but with specialities of feelings and propensities, surprisingly justified by what I knew of them; and being aware that you had no access to them, nor means of knowing them previously, as they were taken at the mo-

Phrenology may be tested in both of these ways, and in both it will be found true to nature. Since, then, the external configuration of the head leads us to a satisfactory knowledge of the talents and mental constitu-

ment promiscuously from numbers of the other criminals, I was at once led to a conviction of the truth of the science, and to see eminent advantages of such knowledge to society, and more immediately in regard to criminal jurisprudence and practice.

Of the instances of your observation, suffer me to mention a few, which at the time occurred to me as peculiarly convincing.

The first man you examined you pronounced "a thief, reckless and dangerous, who, for instance, if under the influence of liquor, would not hesitate to murder or destroy all around him." Now this fellow has for years travelled about the country with a horse and cart, selling salt and trifling articles, and has acquired the character of a masterful thief, and just now stands indicted with a cruel assault on, and highway robbery of a poor labourer, of all his hard earnings last harvest.

Another, you observed, had "a fine intellect, and was likely to have been guilty of swindling;" and the accuracy of this observation on *a painter*, who is indicted for *falsehood*, *fraud*, *and wilful imposition*, *or swindling* is self-evident.

A third, whom you pronounced "a cunning, *daring*, and decided thief," is an incorrigible thief, who for years has, in the most concealed and adroit manner, headed a gang of housebreakers, and is at present indicted for highway robbery, committed by his savagely knocking down with a heavy stob a poor man, who was almost killed on the spot. Private information leads me to understand that he has been party to another crime, of a nature equally, if not more, *daring* and *cruel*.

A fourth you described to be "a depraved and most dangerous man" He is a crony of the man last noticed; has long been a thief, and was one of the most noted corpse-lifters while subjects were bought by the medical schools; and he is said to have been concerned with the man last mentioned in the atrocious crime alluded to at the close of the observations as to him.

A fifth, whom you judged to be "a sly thief, who, with a meek and specious aspect, possessed daring even to cruelty," is a fellow who is by trade a thief, adroit and cunning, and who has often attacked and escaped from the officers of justice. He lately stole in broad daylight, on the streets of Glasgow, a silk handkerchief from a gentleman's pocket, and ran off. Being promptly pursued, he, as a decoy, threw from him the napkin. Being after a race overtaken, he leaped

tion of individuals, there can be no great difficulty in assigning to each individual the mental status to which he is entitled, or in directing the attention of indivi-

into a dung-pit, whither the gentleman could not think of following him, but stood watching him till the police he sent for arrived. On this the fellow in the most fawning manner craved sympathy, and finding this did not move the gentleman's purpose, he suddenly sprung out, and, on being seized, made a desperate struggle, bit severely the gentleman's hand, and by his force and violence, might soon have got off had not the police arrived.

The accuracy of your conclusions has deeply impressed me with the benefit which would accrue to society from the application of such investigations toward the better classification of criminals confined before and after trial, to the selection and treatment of convicts, and even to the more certain identification of such criminals as might effect their escape from justice or confinement.

With much regard believe me to be, dear Sir, yours most faithfully,

GEO. SALMOND,
Pror. Fiscal of Lanarkshire.

We were present on the occasion of Mr. Combe's visit to the Jail of Glasgow, and testify to the perfect accuracy of Mr. Salmond's representation of what happened. Mr. Combe's inferences of the characters of such prisoners as he then examined, were most accurate, and never could have been the result of chance.

WALTER MOIR,
Sheriff-Subst. of Lanarkshire.
D. M'COLL,
Governor of Glasgow Jail.

Second Letter from GEORGE SALMOND, Esq., Procurator Fiscal of the County of Lanark.

SHERIFF'S CHAMBERS,
GLASGOW, *4th May*, 1836.

DEAR SIR,

IN my last I said nothing of the case of a young man charged with murder whom you examined, because the investigation as to him had not been made by me, and consequently the nature of the evidence was unknown to me, but having since heard the whole, as adduced on his trial, I beg leave to trouble you with this addition, as deeming it highly confirmatory of the justness of your remarks at the time you examined him.

duals to those pursuits in which they are calculated to excel.

V. Education to be effective must be *practical*.* Man, surrounded as he is with natural objects, is capable only of investigating successfully the existence, qualities, phenomena, and relations of these objects; he has powers adapted for such investigations, but for no others. He should attempt then the investigation of no subject beyond the range of his faculties, for the investigation can lead to no beneficial consequences. Many

You may remember that you said of him that you could discover nothing remarkable about him as indicative of strong criminal propensity; and that, on being told that he was indicted for the murder of his own father, you said "that his head did not indicate a great tendency to violence," and that "surely he must have had very great provocation."

Now, the proof at the trial showed that the provocation given him was such, that one of the jury was for acquitting him altogether, and the other fourteen, while they returned a verdict of culpable homicide, recommended him to the leniency of the court; and the latter sentenced him only to nine months' imprisonment.

I beg to refer you to the report of the evidence in the Glasgow newspapers of the 28th or 29th ultimo, as amply justifying your conclusions as to this person. His name is Robert M'Anally.

I am, dear Sir, yours faithfully,

GEORGE SALMOND.

See "Testimonials on behalf of George Combe, as a candidate for the Chair of Logic, in the University of Edinburgh," from which the above letters are extracted:—a publication which is calculated to do Phrenology some service.

* Cowley, in his Essays says, "It is deplorable to consider the loss which children make of their time at most schools employing or rather casting away six or seven years in the learning of words only and that very imperfectly."—Locke remarks, "Would not a Chinese, who took notice of our way of breeding, be apt to imagine that all our English gentlemen were designed to be teachers and professors of the dead languages of foreign countries, and not to be men of business in their own?"
—*On Education.*

delight in *pure metaphysical* speculations ; but to what advantage can such speculations be turned, they are in themselves of no value ; and if we concede that they may be indirectly useful in strengthening the reflective powers, it is upon some such principle as if we could approve of tight-rope dancing as an excellent exercise for the muscles, while the same end could be more usefully and safely attained by persevering with energy in our regular and lawful employments. Every department of human knowledge consists of two parts—of facts. Many men are better adapted for collecting simple *facts*, and of conclusions or *deductions* from facts, than for reasoning soundly or drawing just conclusions from the facts with which they are acquainted. Phrenology can not only explain most satisfactorily the causes of these two different qualities of mind, but can indicate with accuracy the individuals in which one or other quality predominates. Science, it may be repeated, essentially consists of *facts*, and inferences from facts ; and Phrenology explains the reason of this, and shows its harmony with the arrangements of nature, by demonstrating that man has powers of *two* kinds only—one kind for appreciating *facts* both physical and mental, and another for reasoning, or drawing conclusions or deductions. Phrenology inculcates that the intellectual powers of man are of two kinds—the knowing and reflecting. This is the phrenological doctrine, and it harmonizes most beautifully with what we find to be the essential nature of all science. If science consisted of something more than *facts* and *reasonings*, of something which the powers of the mind, as indicated by Phrenologists, could not appreciate, then there would

be a gap, a fatal defect in the phrenological system; but we find no such imperfections in the new philosophy. It accounts most satisfactorily for every mental phenomenon, and is, at the same time, in universal harmony with the objects and operations of nature. In calling the new philosophy to our aid in the cultivation of the mental powers, we obtain principles of education applicable, first, to the whole human race; and, secondly, to the mental peculiarities of individuals. We know that all mind emanates from the brain; we know also that at the early periods of life, man is better adapted for observing facts than for reasoning upon them; and we know that at such periods of existence the knowing organs are in a greater activity than the reflecting. Nature herself then points out the tract which ought to be followed. It is clear that the knowing organs should be called into exercise before the reflecting. Did we, however, reverse this order of nature, by attempting to train a child to reason before he had called the knowing organs into operation, and by their operations stored the mind with important facts, we would err as egregiously as if we would attempt to teach a child to dance before it could walk—to sing before it could speak—or to eat the most solid aliment before its teeth had been formed.

Look at the plans of education in vogue at present in many of our Universities, and say if they accord with rational or consistent principles. Suppose a young man enters our universities to be trained up to the *sacred* profession, he must attend a certain number of classes, and according to a determinate order. He enters the University by the door of the Latin class;

he walks next into the Greek ; then he passes into the Logic ; the Moral Philosophy classes now open to receive him ; and after a profound training, it may be, in the subtleties of dialectics, and intricacies of metaphysical speculation, he is thought fit for entering the Natural History and Natural Philosophy class, where he may become acquainted with the objects and phenomena of external nature. Students of the sacred profession (who were afterwards reputed useful and effective preachers) have even been known to have studied no department of science save languages, logic, moral philosophy, and systematic divinity ; who were totally ignorant of the elements of physical science ; who could give no rational explanations of the operations of physical nature ; who uniformly ascribed the operations to the *direct* interposition of the great First Cause. And it is always thus : ignorance and superstition go hand in hand, and the more ignorant a man is of physical science, the more superstitious he will necessarily be. We do not object so much to the sciences which are taught in our universities, as to the order in which they are taught. We object particularly to the pre-eminence given to abstract and metaphysical speculation, to the partial, almost total exclusion of the physical sciences ; and the objection is not made on speculative grounds, but from the following considerations. First, A knowledge of all that appertains to metaphysics is less useful to mankind than a knowledge of physical science. Secondly, The great majority of mankind can excel in some of the physical sciences, while comparatively few attain eminence in metaphysical pursuits : and, Thirdly, The arrangement of studies objected to is inconsistent with

every sound principle of education, as it places that which is difficult before that which is easy, instead of the more rational way of commencing with what is most simple, and leading the way by insensible gradations into that which is more intricate. We do not expect much ratiocination from a child. A child given to abstract reasoning would excite our astonishment, but we are not surprised at a child that it is curious and observant, for all children are so. A child easily gets acquainted with objects that surround him; with *people*, with *inferior animals*, with *household furniture*, with articles of *dress*, with *persons*, with *places*. Varied and extensive knowledge of this kind is accumulated with astonishing rapidity. An ordinary child in the first six years of his existence acquires a knowledge of as many insulated facts as are found in any of our physical sciences, and there can be no doubt that the facts of any of these sciences, could be communicated even to very young children, provided proper plans of instruction were adopted; provided, in other words, their education were of a practical character. There is a natural tendency in the minds of all children to acquire facts, and the pure and simple facts of physical science differ in nothing essential from the facts or existences which meet our daily observation. The child, however, gets quickly acquainted with the objects that surround him, while he moves tardily on with his task in natural history, chemistry, geography, botany, or any other of the natural sciences. And the reason is, that in the one case he obtains a practical knowledge of the objects that are around him; every

thing he practically examines makes a strong and lasting impression on his mind, whereas by studying physical sciences through the medium of books or lectures only, as is too frequently the case, a feeble impression is produced upon the mind. If a child were induced to engage practically in the prosecution of such studies, he could as assuredly be made as easily acquainted with every important fact connected with such sciences, as he could be made to distinguish an orange from an apple, a piece of rock-salt from a piece of loaf-sugar, or gooseberry jam from currant jelly or marmalade. Every part of physical science conversant with material objects must be subjected to the scrutiny of the external senses; the more such objects are scrutinized, the better will they be known, and the more lasting will be their impression on the mind. All education, then, should be practical; theoretical education is education only in name.

But how is the education of man to be effected? in what *order* are the powers of the mind to be exercised? For a satisfactory answer to these questions recourse must be had to Phrenology, for no other system of philosophy can lend the smallest assistance in solving the important problem. Phrenology, however, demonstrates, First, That the brain in the forehead is the seat of the intellectual operations. Secondly, That the brain in its progress to maturity undergoes certain changes of form: and Thirdly, That these changes take place, according to fixed and established laws. In training, then, the intellectual powers of a human being, we ought to be guided generally by the order in which the powers appear. Now we know that the lower

part of the forehead is always sooner developed than the upper, and we ought therefore to cultivate those connected with the lower before those of the upper. In the forehead we find three ranges of organs, the lower, middle, and upper*. If all the organs in the lower region were nearly equally developed, then they might be cultivated in the order in which they are situated, commencing with Language and Individuality, and proceeding outwards to Number. The order of nature in educating a human being is here apparent. The first departments of knowledge which a child should be taught, then, are languages or the meaning of words, more particularly its own language. The facts of natural science, such as chemistry and natural history, or those parts of these sciences which in after-life he may turn to some account. He should also at an early period engage in *drawing, painting,* and the elementary parts of *numbers* or of *arithmetic.* These may be taught during the first fourteen years of a child's existence.† From the fourteenth to the twentieth year,

* See pages, 118, 119.

† A question has been mooted whether or not the mental powers should be cultivated, during the first seven years of the child's age. Some maintaining that the mental cultivation duing that period should be entirely omitted, while others insist, that too much knowledge cannot at this period be imparted, or the child too rigidly trained. Both parties appear to be in error. No system of education is good which overlooks or omits the physical development of the child, and that system is also defective, that omits moral and intellectual training. The arguments that have been adduced against the early intellectual training of children, apply not so much to the use, as the abuse of that training. In children predisposed to disease of the brain, great intellectual efforts should no doubt be avoided, and a long-continued straining of the nervous system would be injurious to constitutions of every kind. But while this must be admitted, the argument does not apply

he may cultivate the powers connected with the second range of organs; these are, Eventuality, Locality, Time, and Tune. Or to express the same idea in ordinary language, between the fourteenth and twentieth year, besides entering more fully into those parts of natural science which had formerly occupied his attention, he will be able during this period to engage in the study of history, geography, chronology, and music; and after the twentieth year, when the upper range of organs attain their full development, he may engage in the more abstract departments of science; in moral and political economy, and the investigation of principles, whether applicable to *science* or to the arts.

Phrenology is not a speculative science. It explains not only all the greater phenomena of mind, but accounts for the dispositions, feelings, the peculiarities of intellect, and the tendencies to particular kinds of action or of conduct which individuals display. It also throws, as we have seen, a broad and steady light upon the general principles of education, upon the

to the *moderate* use of mental exercise in all constitutions, and to regular and daily mental exercise in constitutions of a *particular* kind. In all healthy children, *moderate* mental exercise will increase the health of the brain as much as moderate physical exercise, the tone and growth of the muscular system. The danger lies only in the excess and the quantity of exercise that ought to be permitted, (whether mental or corporeal) which will depend upon the constitution of the child. In children of the nervous temperament, the quantity should be small and alternate frequently with purely physical exertion, and in those of the lymphatic temperament much greater. Indeed mental excitement that would prove injurious to nervous children, would conduce to the health of children of a different constitution. Many children require a variety of stimuli, to induce in their torpid system the highest health, and in such constitutions the stimulus of mental exertion is necessary to the full development of the brain.

education of individuals, and on the means of improving eventually, the whole human race. It lays the axe to the root of the fallacies, that man is the creature of circumstances ; that all men are naturally equal ; and that all the powers of the mind are susceptible of indefinite improvement. It demonstrates, that as all the mental phenomena are dependent on the brain, that external circumstances can no more change the talents and disposition of individuals, than they can change the organization of the brain ; and that until such a transformation takes place, these positions must be erroneous. It shows that all men are not naturally equal, for no two brains are found precisely alike ; and that the doctrine of the indefinite improvability of man cannot be true so long as the brain is an organized mass, and like every organized body susceptible of growth, maturity, and decay. Phrenology is not only calculated to give us a clear insight into the workings of the human mind, but it enables us also to render the mental powers available to the possessor.

It must be admitted that the majority of mankind are possessed of *partial* talent. A man that can excel equally in every department of art and science, does not exist. His existence is a physical impossibility. But even admitting the possibility of the case, a question arises, whether it would be more PRUDENT to cultivate one or a few of these powers to the degree of which they are susceptible, or to attempt to cultivate all the powers and attain only a mediocrity in each. Had Paganini, for example, attempted to excel in mathematics, metaphysics, poetry, painting, languages, &c., as well as in music, would he have stood so pre-eminent

above his compeers? He probably would not have been known beyond the city of Genoa, in which he was born. The powers of man are limited, and it is better that he should do little and *that* well, than that he should attempt much and do nothing successfully. Now, is it a matter of little moment that Phrenology should be able to point out what powers of the mind are capable of the most successful cultivation in any individual? Is it nothing that whole years of unavailing efforts should be saved? that the child from his earliest infancy should be directed into the path in which his own happiness is to be found, and in which he can most successfully promote the happiness of others? Nobody will doubt that if Phrenology can lead to this end, that it is capable of effecting much good; and every one acquainted with Phrenology also knows that the talents of any individual can easily be recognised, and their relative power consequently easily calculated.

The systems of education inculcated by philosophers, and followed in our schools, are too theoretical to be useful. A book is placed in the hand of a child before it can speak its own language. It is taught to commit to memory passages in prose and passages in poetry. To impart to it correct ideas of morality and religion, it is made to read a treatise on moral duty and to commit to memory psalms, and hymns, and passages of the Bible. In teaching some of the abstract sciences even the same principle prevails. A young man engages in the study of mathematics, the Elements of Euclid are committed to *memory*, and his mathematical studies are supposed to be successfully terminated. In the cultivation of every science the same principle to a

very great extent prevails. The student who has committed to memory the principal facts in anatomy, chemistry, and the other departments of medical science, is considered to be sufficiently qualified to practise. Now, this plan of education leads to the cultivation of one power of the mind at the expense of the others. In all these cases the verbal memory is chiefly cultivated; and he who believes that by cultivating that power all the others are necessarily improved, falls into a common but egregious error. Phrenology leads to a more just conclusion. It shows that the powers of the mind are as independent of each other as the organs of sensation, and who would think of improving, for example, the organ of touch by merely exercising the organ of *vision?* Every power of the mind requires, therefore, to be cultivated for itself.

In educating a human being it is necessary to remember that he is born with Propensities and Sentiments, as well as powers more purely Intellectual, and although it is the principal end of education to improve the intellectual part of man to the highest point of which it is capable, still the *moral* part of his nature is deserving of much consideration. In mankind, generally, the organs of the Feelings are more active than those of the Intellect. They are, consequently, more apt than those of the understanding to run into excesses of various kinds, and to entail misery on all around them. It is clear, then, that the Feelings should be *early* governed and directed. Every feeling, as well as intellectual power, becomes stronger by exercise and weaker by disuse, and this is in harmony with every organ of the body. Muscles that are frequently

employed increase in size and strength, and those which are never brought into operation dwindle and lose their contractile power.

The Propensities should be kept in constant subserviency to the Intellect, while the Sentiments should be cherished by every means which circumstances afford for this purpose. As the *Propensities* are drags upon our intellectual nature, they should be repressed at an early age, and soothed and tamed into due submission to the will; while, as the *Sentiments* impart a high tone of feeling to the character, their power should be directly and indirectly promoted, and, except in certain cases their activity kept in constant operation. But how is this last to be effected? I answer, by placing the individual frequently in circumstances calculated to call such sentiments into operation. Verbal description may, no doubt give rise to all the sentiments, but by this method the feeling is weakly excited, compared with *objects* that directly affect the senses. The reading of a tragedy excites less emotion than witnessing its representation on the stage, and the closer the representation mimics the reality the emotion will be the more powerful.

A child may be told to cherish the feeling of veneration, but if you wish him to experience the feeling powerfully you must lead him frequently to the very *act* of devotion, and let him sympathize with the feeling as it displays itself in others. In this way only should the sentiment of veneration be cultivated, and the principle is applicable to the training of all the other powers of the same kind.

But man is a being not only endowed with *Feelings*

but with *Intellect*, and the intellectual powers display themselves at a very early period. The knowing organs are first called into operation, as these bring in the *pabulum* for the action of the reflecting powers. Of the knowing powers, Language and Individuality are among the first that should be cultivated, and the others according to their *relative size*. While cultivating the knowing powers, the reflecting ones should, to a certain extent, regularly be employed ; although in almost all our plans of education the knowing powers of children are cultivated, to the neglect almost altogether of the reflecting. Children are made to wait till they are fit for a logic or moral philosophy class, before the reflecting powers are brought into action. But the plan is highly objectionable. Every object which presents itself to his daily observation, every subject on which the knowing organs may be engaged, is fitted to call into exercise both comparison and causality ; and the child who has been trained to exercise these organs from his early years, and on subjects of common observation, will, *cæteris paribus*, use them with more effect when he arrives at maturity, and when he directs them to the investigation of truth in science and philosophy. Man cannot become too intellectual ; and as his intellectuality depends on the existence of these powers, they should be early and regularly brought into operation. Yet though all the reflecting organs should be cultivated to the highest degree of which they are capable, the observation is not applicable to the knowing organs. All of these organs indeed should be cultivated to a *certain* extent ; but when any are pre-eminently developed, these should be cultivated

to the partial exclusion of the others, and the individual so circumstanced should engage in a profession in which such powers are peculiarly brought into operation. In this way individuals will be enabled to follow the bent of their inclination to advance the interests of particular arts or sciences, and conduce, consequently, to their happiness and to the greatest improvement of the human race.

Phrenology is not only calculated to discover the talents of individuals, and to teach us to cultivate with effect talents which exist, but under proper direction it may be made the stupendous instrument of improving the intellectual capacity of the whole human race.

The brain is a part of the corporeal frame, and subject to the same laws that regulate the development of every other corporeal organ.* The corporeal part of man is under the same system of laws which governed the formation, the growth, and decay of the corporeal parts of animals generally. To prevent animals from degenerating, and to enable them to attain the highest perfection of which their natures are capable, we require to improve not only the corporeal powers of individuals, but by attending to certain well known

* The purely *physical* part of the education of man is of paramount importance; but has not been sufficiently insisted upon by many of our best writers upon Education. The more, however, Phrenology is studied the more will its importance be appreciated. As a part of the body, the brain must rise and fall with the varying health of the system; and the improvement of the corporeal system generally must necessarily raise the healthy condition of the brain. We can only advert at present to the subject; but it is one full of interest. When the ancients spoke of the "mens sana in corpore sano," they spoke with their accustomed wisdom; and it is obvious, that so long as the animal part of our constitution is linked with the mental, the training of the one must form as essential an ingredient as the education of the other.

laws, we can improve or deteriorate the whole breed. How are our race-horses so superior? How can we form kinds of dogs which will differ so much from each other in instincts and corporeal powers? Can the character of these animals be changed by *education alone?* Other conditions are required, and by attending to these conditions, the requisite changes can be effected. Man is no exception to the general law; but he seems to think that he is, for while he devotes so much time to the improvement of the various races of domesticated animals, he never seems to suspect that by acting on similar principles his own progeny could be improved. Every peculiarity of corporeal conformation is transmitted from generation to generation. Family *heads* are to be found, as well as family talents and dispositions; and if we improve the character of the former, then we will assuredly affect in the same ratio the character of the latter.

The majority of mankind, it is to be regretted, do not take this view of the subject. In forming matrimonial alliances, many men are influenced by motives of which, as intellectual beings, they ought to be ashamed. A man who marries purely for money, who is captivated by a fine foot, an elegantly formed ankle, a slender waist, or a languishing eye, is rarely himself intellectual, and *intellectuality* will seldom be the predominating characteristic of his children.

PRACTICAL EXAMINATION OF THE HEAD.

The first thing to be attended to, in the practical examination of the head, is the *absolute size* of the head; for a large head, *cæteris paribus,* always shows more power than a small head. The head should next be viewed as divided into four regions, an anterior, a posterior, a superior, and an inferior. The relative size of the anterior and posterior may be seen by extending a line from ear to ear over the crown of the head; and the superior and inferior regions may also be compared by a line which encircles the head on a level with the middle of the forehead, or, more correctly, by a circular line drawn at the level of Causality, Caution, and Inhabitiveness. The effects produced by the predominancy of any of these regions have already been adverted to. It requires, however, to be stated, that that part of the brain that lies anterior to the ear is not *all* concerned in intellectual function—a part of it is formed by the *middle lobe* of the brain, and consequently a part of it is the seat of feeling. The size of the anterior lobe must be calculated from the breadth and elevation of the forehead. On the heads of Hare, and the Rev. Mr. Martin, the line A B, or the *oblique* line, insulates the intellectual part of the brain; and the *horizontal* line is drawn between the seat of the sentiments and propensities. After a knowledge has thus been obtained of the great outlines



Hare



Pope Alex.r VI



of the head, the relative size of the organs in each region must next be observed; and repeated experiments and observations will soon enable the majority of Phrenologists to arrive at just conclusions upon this part of the subject. The eye and hand are better measurers both of form and size than callipers or any other instrument, and should be made to supersede every such instrument. In forming an estimate of the comparative size of the organs, Phrenologists observe, first, the elevations and depressions when such exist upon the head, and secondly, the extent of space between the site of the organ and the opening of the ear. The ear is referred to because it is nearly opposite to the *medulla oblongata*, or part from which the fibres of the brain commence and radiate to the convolutions which are situated immediately under the cranium;—the longer the fibres, generally speaking, the larger the organ.

The student of Phrenology should not only acquire a knowledge of the individual organs and their functions, but he should frequently view them in combination, and calculate the effects of the combination of organs in the formation of character. This is one of the deepest subjects connected with Phrenology. We can only wait to notice the manner in which the subject should be investigated. In estimating the character of an individual, the student should first observe the relative proportions of the Propensities, Sentiments, Knowing and Reflecting intellect. If any of these grand divisions greatly predominate, no difficulty will be experienced in arriving at a decided general conclusion. If the Propensities exclusively predominate,

brutality of conduct will be the result ; if the Sentiments alone bear the sway, the amiable qualities will abound ; if the Knowing organs are in similar circumstances, talents of observation will be the consequence ; and should the Reflecting organs be exclusively developed, the person so constituted will be deemed a visionary. After he has thus examined the great outlines of the head, the student should next observe which of the organs are largest in one or more of the above subdivisions, for a direction will be given to such organ or organs from the more predominating *regions* of the brain. For example, if the basilary region be very large, although *one* of the sentiments be well developed, that sentiment will receive a hue and tincture from the predominance of the propensities, and even all the knowing and reflecting powers will bend in these circumstances under the dominion of the propensities, or run in the direction of these lower powers. When the coronal region is high, and *one* of the propensities, such as destructiveness, large, the lower organ will be robbed of its fierceness, and modified by the softening and benign influences of the superior powers. The intellect, under these circumstances, is drawn as by a celestial influence to direct its energies so as to gratify these sublime feelings of our nature. When the intellect again is large, and the propensities and sentiments small, energy and fine feeling are withdrawn, and a mental constitution formed, but ill adapted for this "breathing world." The intellect requires the impelling power of the propensities and sentiments even to do justice to itself, and the propensities and sentiments equally require the guidance of enlightened

intellect. The best combination is that in which all the regions of the head are equally and well developed, or if any region should predominate, it is that of the Sentiments, as these impart moral and religious dispositions, which conduce more to the well-being of man than Intellect itself.

In estimating the character of any individual, we should note also the relative size of each of the organs, and calculate the influence which they reciprocally have upon each other. This is by far the most difficult part of the subject, and for the performance of which no rules can be condescended upon. It must be left to the sagacity of the student, and can only be accomplished by high *intellectual endowments.*

Phrenology, it has been said, cannot be true, because it leads to materialism, and thus undermines the principles of morality and religion. It is to be regretted that the opponents of phrenology should have recourse to such a subterfuge in shape of argument—a subterfuge that savours so much of ignorance and bigotry. Phrenology leads to no such conclusion. The venerable founders of the system disclaim such an inference, and many able and enlightened ministers of religion rank amongst its champions, and who would be the last to advocate any doctrine that would lead to such a conclusion. We all admit the eye is the organ of vision, and that without the eye the mind cannot see. But do we allow that the belief of such a doctrine leads to materialism? Certainly not. We all admit that the mind may exist after the eye is destroyed, although it cannot see without such an organ; so we admit that the essence of the mind may exist after

the brain is destroyed, although that organ is necessary in the present state of things for the mental manifestation. It is not Phrenology, but the *contrary doctrine* that leads to a dangerous conclusion. The anti-phrenologist cannot account for mental aberration of any kind without assuming a principle that leads to a most appalling conclusion. In insanity, for example, he says the *mind* is deranged. But can the mind become so affected? Can that pure etherial being, that emanation of Deity itself, that incomprehensible existence whose aspirations rise above all sublunary things, and whose desires are as boundless as eternity—can that being become deranged? If we answer this question in the affirmative, we state in so many words that the mind can become diseased, and if liable to disease it clearly follows that it may die. But Phrenology leads to no such conclusion. Phrenology draws a broad line of demarcation between the organ of the mind and the mind itself, and it is obvious that what may be predicated of the one does not necessarily apply to the other. There is nothing in Phrenology at variance with the consoling doctrine of the mind's immortality; for though the organ of the mind perish, the mind itself may not only survive, but even, (to use the words of Addison,)

> "Flourish in immortal youth,
> Unhurt amid the war of elements,
> The wreck of matter, and the crash of worlds."

EXPLANATION OF THE PLATES.

In these plates, the heads of four well known characters are represented; two in which the Intellectual and Moral departments of the brain predominated, and two in which the very opposite conformation existed, and what is the conclusion that would necessarily be deduced from these forms? Would not a Phrenologist at once indicate intellectuality and all the moral and religious qualities from the former, and every low and degrading vice and atrocity from the latter.

The head of Hare shows a decided preponderance of the propensities over the moral sentiments and intellectual powers, and his acts were such as to fill every well constituted mind with horror and disgust. In the engraving, Hare's head is in profile, and consequently an imperfect idea can only be formed from it of the size of the moral sentiments, for the *breadth* of the upper region cannot be seen; but in the *cast* of his head this part is narrow as might have been expected.

In the head of Pope Alexander VI. we have still a worse conformation. The whole head is thrown backwards in the direction of the basilary region, which is prodigiously large, with a lamentable deficiency of the forehead and upper regions. At the very first glance,

a Phrenologist would conclude that the character was grossly bestial, without a redeeming amiable quality. And what was actually his character? Let history tell.*

In the Rev. Mr. Martin, there is not only a considerable development of brain before the ear, but it rises high in the coronal region; thus indicating, phrenologically, great endowment of moral and religious feeling, and respectable intellectual powers. His character corresponded accurately with his developments.†

In the head of Melancthon we have the *beau ideal*

* "Pope Alexander VI. This disgrace to the papal chair, whose family name was Borgia, was born at Valencia, in Spain, in 1431, and succeeded Pope Innocent VIII. in 1492. His life was a series of crimes. By his concubine Vanozzi, he had five children, worthy of such a father, and of these Cæsar, the most infamous, was his favourite. In all his political connexions he was treacherous, beyond the usual measure of treachery in politicians. The pontifical claims to supremacy lost nothing in his hands. It was he who divided between the Spaniards and Portuguese the recently discovered realms of America, by drawing a line from pole to pole, a hundred leagues to the westward of the Azores, and assigning to the former people all the realms to the west of it, and to the latter all those to the east. This hateful pontiff died in the year 1503; and is said to have fallen, by mistake, a victim to poison, which he and his son Cæsar had prepared for others."—*Davenport's Dictionary of Biography.*

† "Mr. Martin is stated, by his medical friend, to have been upwards of thirty years a minister in a Baptist congregation, and that he was first brought up to the trade of watch-making, but which he soon abandoned for pursuits more congenial to his tastes and inclinations. By great application he became a scholar and a man of considerable learning. Besides, his medical friend spoke of him in terms of the highest respect; as a minister, esteemed by all his congregation; as a man, of most exemplary conduct, and of the strictest integrity, who showed great care and economy in the management of his own affairs."—*Phrenological Journal.*

of phrenological development. The forehead is splendid—"The front of Jove himself." The coronal region towers to a magnificent height above the ear, and the posterior and basilary regions, so far as they can be observed, are comparatively small. This conformation would indicate, phrenologically, profound and comprehensive intellect, pure and elevated moral sentiments, with mildness of disposition: and observe how his character corresponded.*

* "Philip Melancthon, a celebrated Protestant reformer, was born, in 1497, at Bretten, in the Palatinate. His real name was Schwartzerde, or Black Earth, of which Melancthon is a translation. He studied at Wittemberg and Tubingen; and, in 1518, was appointed Greek professor at Wittemberg, where he became the friend of Luther, and a convert to his doctrines. To the diffusion of the new doctrines he powerfully contributed; but he displayed a moderate and conciliatory spirit, which was displeasing to the more imperious Luther. The Confession of Augsburg was the work of this reformer. Even his theological enemies respected the virtues, the talents, the learning, and the mild temper of Melancthon. He died at Wittemberg in 1560. His works form four folio volumes."—*Davenport's Dictionary of Biography.*

Spurzheim* thus describes the head of Melancthon:—" It is the brain of an extraordinary man. The organs of the moral and religious feelings predominate greatly, and will disapprove of all violence, irreverence, and injustice. The forehead betokens a vast and comprehensive understanding, and the *ensemble* a mind the noblest, the most amiable, and the most intellectual, that can be conceived." "Never was any man more civil and obliging, and more free from jealousy, dissimulation, and envy, than Melancthon; he was humble, modest, disinterested in the extreme; in a word, he possessed wonderful talents and most noble dispositions. His greatest enemies have been forced to acknowledge that the annals of antiquity exhibit very few worthies who may be compared with him, whether extent of knowledge in things human and divine, or quickness of comprehension and fertility of genius, be regarded. The cause of true Christianity derived more signal advantages, and more effectual support from Melancthon, than it received from any of the other doctors of the age. His mildness and

* Phrenology in connexion with Physiognomy.

charity perhaps carried him too far at times, and led him occasionally to make concessions that might be styled imprudent. He was the sincere worshipper of truth, but he was diffident of himself, and sometimes timorous without any sufficient reason. On the other hand, his fortitude in defending the right was great. His opinions were so universally respected, that scarcely any one among the Lutheran doctors ventured to oppose them. He was inferior to Luther in courage and intrepidity, but his equal in piety, and much his superior in learning, judgment, meekness, and humanity."

APPENDIX.

No. I.

On the Modifications *of the Affective and Intellectual Functions, (abridged from Dr. Spurzheim's work on the Philosophical Principles of Phrenology.)*

In philosophy it is commonly admitted, that the world is different to every species of animals, and even to every individual of the same species. This is easily understood, when we consider that all the beings of nature are in relation one to another, and that those endowed with consciousness recognise this—in other terms, perceive various impressions made on them by other beings. Now, it is evident that each must perceive impressions in proportion to the number and energy of its sentient faculties. Hence it results that the world differs to different species of animals; that it is essentially the same, but modified to individuals of the same kinds: and that man, who unites all the faculties distributed among the other living tribes, and possesses some peculiarly and alone, has, so to speak, the most extended world, though this be still modified to individuals, as it is among animals of the same species.

I shall now investigate the *modifications* of the faculties more in detail. First, then, the manifestations of every faculty are greatly modified in different kinds of beings. This appears from the functions of those faculties, both of vegetative and animal life, which are

common to man and animals. The liver secretes bile, the kidneys secrete urine, the salivary glands saliva, &c.; yet these secretions vary in different kinds of animals, and are even modified in individuals of the same species. The power of motion is modified in different kinds of animals; and the consistence, texture, and state of its organs; the muscles also vary. The external senses offer modifications according to species and individuals. Now, are the faculties attached to the brain also modified in different animals?

If we examine their applications, there can remain no doubt of it. The function of the cerebellum must be modified in every species, because the individuals of each prefer others of their own kind. Sometimes also it is quite inordinate. Modifications of Philoprogenitiveness are not less certain. Animals love the young of their own more than those of other kinds. Inhabitiveness must be modified in animals which live in the water, on dry land, in the air, and at greater or less elevations. Adhesiveness presents many modifications in solitary and in social animals. Destructiveness and Constructiveness are much modified; all animals do not kill in one way, and the nests of all birds are not built in the same manner. The song of birds, and the instinct to migrate, are modified universally. Similar observations might readily be made in regard to the whole of the Propensities, Sentiments, and Intellectual Faculties. Thus it is certain, that all are modified both in species and in individuals. Nay, it seems to me that there are idiosyncrasies of all the mental functions, as well as of digestion and the external senses. Certain stomachs do not digest some par-

ticular substances ; some individuals cannot bear certain odours, savours, colours, and sounds; and some cannot endure certain modes of feeling or thinking, certain successions of tones, of ideas, and so on. The same thing is approved or disapproved of by different people, according to the manner in which it is proposed.

Another cause of the modified manifestations of the faculties, is their mutual influence. I only consider the human kind at present. It is indubitable, that if two or more persons do the same thing, it will be done in a modified way by every one. Inasmuch as the faculties are essentially the same, the same actions are observed in all mankind : nay, in as far as nations have similar predominating faculties, there prevails a certain analogy in their actions and manners, because these are effects of the special faculties and their combinations ; it is only their modifications and different combinations that produce varieties in action. Every faculty may act combined with one, or two, or more. The number of binary, ternary, and more multiplied combinations is, therefore, immense, especially if it be remembered that each may be modified in itself, and may be more or less energetic. As this subject, however, is of the highest importance in anthropology, and indispensable to the elucidation of my ideas, I shall treat it somewhat in detail, and choose examples easily understood, and interesting to every one.

Physical love alone, combined with Adhesiveness, Philoprogenitiveness, Benevolence, and Veneration, or with the propensities to fight and to destroy, acts very differently. Two affectionate mothers, of whom

the one has Philoprogenitiveness, combined with much Self-esteem, much Firmness, a great propensity to fight, and little Benevolence; and the second, Philoprogenitiveness, combined with Adhesiveness, Benevolence, Veneration, and very little Self-Esteem and propensity to fight, will love their children in very different manners. Determinate or individual justice varies extremely. Justice gives laws universally, but these are modified according to the particular and combined faculties of legislators. What a difference in the characters of Lycurgus and Solon; but what a difference in their precepts also!

Man universally believes in one or several gods; but what a difference between the gods of different nations, and even of different men! The gods seem to me everywhere represented with faculties conformable to those of the nations by whom they are adored or of the religious legislators who have commanded in their name.

Music is different in every nation. We easily distinguish that of the Italians, Germans, French, Scots, &c. Even the music of each composer offers something particular, and connoisseurs distinguish that of Gluck, Mozart, Haydn, and others. It is the same with *painting*. All painters are colourists, but there is a difference in their modes of colouring; and every one as regularly prefers certain colours as subjects. Hence the difference in the pictures of Titian, Rembrandt, Paul Veronese, Albano, and others. The canvass of Titian shows reflection and combination; that of Paul Veronese his fondness for architecture; Albano again betrays his amorous inclination; and so of the rest.

The languages of different nations present fine examples of modifications produced by the mutual influence of the faculties. I even admit, that the spirit of its language proclaims the predominating faculties of a nation. It is evident, that a nation with many feelings or ideas must have many signs, and that the number of any one kind of these indicates the energy of the faculty they represent. Thus, the Greek and French languages have a greater number of tenses than the German and English. The French, on the contrary, is poor in expressions of reflection and of sentiment; moreover, it has few that are figurative; while the German is rich in all of these, and has also many more signs of disjunction. Frenchmen have the organs of Individuality and Eventuality very much developed, and are therefore fond of facts; but their faculties of Comparison and Causality are commonly smaller. The Germans, on the other hand, are fond of analogies, perhaps too much so, for they compare and wish to explain every thing.

The construction of languages proves also the modified manners of thinking of different nations. The French like facts, and direct their attention to them, without first considering causes. It is natural, indeed, to begin with the subject, then to join the action of the subject, and after this to express other circumstances. This the French do regularly. If cause and effect be considered, they always begin with the effect, and relate the cause afterwards. The Germans proceed in a very different manner, and their tongue in this respect requires much more attention than the French. It also ordinarily begins with the subject;

then follow expressions of the relation between subject and object, both of which are mentioned ; and lastly, the action of the subject upon the object is considered.

From these observations upon language, we may conceive that the spirit of no *one* language can become general. I am of opinion that the spirit of the French will never please Germans ; and that Frenchmen, on the other hand, will always dislike that of the German, because the manner of thinking, and the enchainment of ideas, are quite dissimilar in the two nations.

I am further convinced that different philosophical systems have resulted from various combinations of faculties in their authors. He who has much of the faculty of Eventuality will never neglect facts. He who possesses less of it, and a great deal of the faculties of Comparison and Causality, will begin to philosophize with causes, and construct the world, instead of observing its existence. He, on the contrary, in whom the faculty of Causality is less active, will reject this mode of consideration, and may think it unphilosophical to admit a Primitive Cause. The philosopher in whom the superior sentiments are very energetic, directs his mind principally to moral principles, and then we have various systems of virtue and morality, according to the predominance of one or other of these.

It would be easy to quote examples in the case of every faculty, to prove the mutual influence of the whole ; but I shall only dwell on this principle, in reference to abuses of the faculties, for the sake of showing how peculiarities may be explained which seem inconceivable to those who know nothing of Phrenology.

Suppose, for instance, we are told that of two inve-

terate thieves presented to us, one has never scrupled to rob churches, whilst the other has, the robber of the church may be distinguished from the other: he who has the smallest organ of Veneration is the thief of the holy articles. Suppose we see two women in confinement, and are told that one has stolen, and that the other has concealed the stolen things; the former will have the organ of Acquisitiveness larger, and that of the propensity to conceal less; while the second will have the organ of Secretiveness much developed. If we would detect the chief of a robber band, we examine the organs of Self-Esteem and Determinateness. We may distinguish a habitual vagabond thief from a coiner of false money, by his having, besides the organ of Acquisitiveness, the organ of Locality larger, and smaller organs of Cautiousness and of Constructiveness. We may also distinguish dangerous and incorrigible criminals from the less desperate and more easily amended. They who have the organs of the Sentiments proper to man, and of Intellect very small, but those of the Propensities to fight, to destroy, to conceal, and to acquire, very much developed, will be corrected with far more difficulty than such as have the organ of Acquisitiveness very much developed, but at the same time the organs of the human faculties and of Intellect large, who, in short, are susceptible of moral *will.*

APPENDIX.

No. II.

Excerpt of the Report made to the Royal Academy of Sciences of the Institute, on M. Flourens' work, entitled Determination of the Properties of the Nervous System, or Physical Researches on Irritability and Sensibility.

"Wounds of the cerebrum and cerebellum produce no more pain than convulsions; and in common language, it would from that be concluded that the cerebrum and cerebellum are insensible. But M. Flourens says that these tracts are the sensible tracts of the nervous system, which simply signifies that it is to them that the impressions received by the organs endowed with sensations must arrive, in order that the animal may experience the sensations. M. Flourens seems to us to have well proved this proposition, as regards the senses of sight and hearing: when the cerebral lobe of one side is removed, the animal sees no longer on the opposite side, although the iris of this eye preserves its mobility; when the two lobes are removed, it becomes blind, and cannot hear. But we cannot say that he has equally well proved it as regards the other senses. In the first place he has not, nor could he make any experiments respecting the smell and the taste; then, as regards the sense of touch itself, his experiments do not appear to us conclusive. In fact, the animal so mutilated is quite drowsy; it has no will of its own, it makes

no spontaneous motion, but when struck or irritated it rouses itself as from a sleep. In whatever position it is placed it preserves its equilibrium. If laid on its back it rises, it walks if pushed. When it is a frog it jumps if it is touched ; when a bird it flies if thrown up into the air ; it struggles if annoyed ; if water is poured upon its beak it swallows it. Certainly it will be difficult to believe that these actions take place without being provoked by any sensation. It is very true that they are not rational. The animal escapes without any object in view ; it no longer has any memory, and frequently stumbles against the same obstacles. And this moreover proves, and these are the expressions of M. Flourens, that such an animal is in a dormant state: it acts like a man asleep. But we are far from believing that a man asleep, who moves during his sleep, who in this state knows how to place himself in a more convenient position, is absolutely deprived of sensation ; and because the perception of this has not been distinct, and that he has lost all recollection of it, is no proof that he had not possessed them. Instead of saying, as the author does, that the cerebral lobes are the sole organs of sensation, we shall restrict ourselves to the facts observed, and merely say that these lobes are the sole receptacle where the sensations of sight and hearing can be consummated and become perceptible to the animal: that if we wished to add more to this appropriation we should say that the cerebral lobes are the point where all the sensations take a distinct form and leave durable impressions and recollections ; that they are, in fact, the seat of memory, a property by means of which the animal is furnished with the mate-

rials for its judgments. This conclusion, expressed in this way, would be sufficiently probable, although in the structure of these lobes and their connexion with the rest of the system, and in the constant proportion of the volume of these lobes with the degree of intelligence of the animals, comparative anatomy offers another confirmation.

" After the effects of ablation of the brain, properly so called, M. Flourens examines those of the extirpation of the quadrigeminal tubercles. The removal of one of the two, after a convulsive action which immediately ceases, produces blindness of the opposite eye, and an involuntary whirling round ; that of the two tubercles renders the cecity complete and the whirling more violent and more prolonged. Yet the animal retains all its faculties, and the iris is still contractile. The entire extirpation, or a section of the optic nerve alone, paralyzes the iris: from which circumstance M. Flourens concludes that extirpation of the tubercle produces the same results as a section of the nerve, that this tubercle is as regards vision only a conductor ; and that the cerebral lobe alone is the limit of the sensation, and the place where it is consummated by becoming converted into perception. After all it must be observed that in too deeply extirpating these tubercles we interfere with the medulla oblongata, and then violent convulsions, which last long, make their appearance. What appears to us to be most curious and unheard of in M. Flourens' experiments, concerns the functions of the cerebellum. During the ablation of the first slices, only a little weakness and a want of harmony in the movements that occur. At the removal of the

middle slices, an almost general agitation is the result. The animal continuing to hear and to see, only executes abrupt and disorderly movements. Its faculties of flying, walking, standing up, &c., are lost by degrees. When the cerebellum is removed, the faculty of performing regulated movements has entirely disappeared. Placed on its back the creature could not get up; yet it saw the blow that threatened it, it heard noises, it endeavoured to avoid danger, and made many efforts to do so without accomplishing its object. In a few words, it retained the faculties of perception and of volition, but it had lost the power of making its muscles obey its will. It was with difficulty that a bird stood up, resting upon its wings and tail. Deprived of its brain, it was in a dormant state; deprived of its cerebellum, it was in a state of apparent drunkenness.

" 'It is a surprising thing, says M. Flourens, 'to see a pigeon as he loses his cerebellum, gradually losing the power of flying, then that of walking, and at last that of standing up, which is also gradually lost. The animal begins by not being able to stand straight upon its legs; then its feet are not sufficient to keep it up. At last, any fixed position is impossible; it makes incredible efforts to attain some such position, without effecting it; and yet, when fatigued and exhausted, it appears as if it wished to be quiet; its senses were so acute that the slightest gesture reproduced contortions, without the least convulsive action, as long as the quadrigeminal tubercles and medulla oblongata remained untouched.' We do not know of any physiologist who has made known any of these singular phenomena.

" Experiments on the cerebellum of quadrupeds, and especially on that of adults, are very difficult to be performed, on account of the large masses of bone which it is necessary to remove, and the large vessels which must be opened. Besides, most experimenters have operated after systems imagined beforehand, and were apt to overlook whatever they did not wish to see; certainly no one had yet supposed that the cerebellum was in any manner the balancer, the regulator of the locomotive movements of the animal. This discovery, if experiments repeated with all due precautions establish its generality, cannot but confer the greatest honour on the young observer whose work we have analyzed. From what has been said, the Academy, as well as ourselves, is in a position to judge, that independently of superfluous mutations of language, and of known facts, which the author was obliged to bring forward to give connexion to his work, this memoir offers, on many old facts, more concise details than any we possessed before, and contains others as new as they are precious to science.

" The integrity of the cerebral lobes is necessary for the exercise of vision and hearing; when they are removed, the will is no longer manifested by spontaneous acts. Yet if the animal is suddenly excited it executes regular locomotive movements, as if it constantly endeavoured to fly from the pain, and manifests uneasiness; but these movements do not affect the object in view, very probably because its memory, which has disappeared with the lobes, which were its seat, no longer furnishes a base or elements to its judgments.

" These movements, for the same reason, have no

sequel, because the impression which has caused them leaves neither remembrance nor durable will. The integrity of the cerebellum is necessary to the regularity of the locomotive movements: let the cerebrum be entire, the animal will see, hear, and have volition of different kinds, very apparent and energetic; but if the cerebellum is removed, it will never have the power of preserving the equilibrium necessary for its locomotion. Yet the parts retain for a long time their irritability, without being in want of the cerebrum or cerebellum; irritation of a nerve is still followed by contraction of the muscles to which it is distributed; irritation of the spinal marrow produces action in the parts placed beneath the irritated point. It is altogether at the top of the medulla oblongata, at the spot where the quadrigeminal bodies are attached to it, that this faculty ceases of receiving and propagating, on one part irritation, and on the other pain. It is at least at this point that sensations must arrive to be perceived. It is also from hence that the mandates of the will must depart. Thus the continuation of the nervous organism, from this point to all parts of the system, is necessary to the execution of spontaneous movements and the perception of impressions, whether internal or external.

"All these conclusions are not identical with those of the author, and especially they are not expressed in the same terms. But they are those which have appeared to us to result the most rigorously from the facts which he has so well established; they, without doubt, will suffice to enable you to judge of the importance of the facts adduced to engage you to express your ap-

probation to the author, and to invite him to continue to communicate to you accounts of whatever further progress he makes in a labour so very interesting.

(Signed) "Portal, The Count Berthollet,
Pinel, Dumeril,
"The Baron Cuvier, Reporter.

"The Academy approves of the report, the conclusions of which it adopts, and orders it to be printed.

"Certified in accordance with the original,
"The Perpetual Secretary, Baron G. Cuvier."

Experiment of M. Flourens in proof of his opinion "that the cerebral lobes are the exclusive seat of the *sensations, perceptions,* and *volitions.*"

M. Flourens removed, at the same time, the two cerebral lobes of a healthy chicken.

The animal, thus deprived of its cerebrum, survived ten months in a state of perfect health, and would in all probability have lived longer, if M. Flourens had not been obliged to leave Paris.

During the whole of this time, M. Flourens closely watched all the actions, habits, &c. of the animal, and the following is the result of his observations:

He had scarcely removed the brain, before the sight of both eyes was suddenly lost; the hearing was also gone, and the animal did not give the slightest sign of volition, but kept himself perfectly upright upon his legs, and walked when he was irritated, or when he was pushed; when thrown into the air, he flew, and swallowed water when it was poured into his beak.

He never moved unless he was irritated; when placed upon his feet, he remained upon them; when seated on his belly, in the manner that chickens do when they sleep, he remained in that position; he appeared plunged in a sort of drowsiness, which neither sound nor light in the slightest degree disturbed; nothing but direct irritation, such as pinching, or pricking, or striking, had any effect in rousing him.

When the animal did move about, it seemed to do so without any motive or object, though there were no convulsions, nor any want of harmony in its movements; if it met with any obstruction, it did not know how to avoid it.

The chicken was quite healthy, and five months after the operation, the wound had quite healed, and a new layer of bony matter was forming.

Still it had no sense of smell or taste; neither had it any sensation of hunger or thirst; for after allowing it to fast for three whole days, and then placing food immediately under its nostrils, and afterwards putting it into its beak, and also putting its beak into water, it did not show the slightest disposition either to eat or drink, and would have died for want of nourishment, if it had not been fed by force.

It seemed entirely to have lost its memory, for if it struck itself against any body, it would not avoid it, but repeat the blow immediately.

Finally, it will be seen, that in a bird from which the cerebral lobes were removed, but in which the organs of sight, hearing, taste, and touch were perfect, the impressions received by them were not perceived

by the individual himself; in short, that the bird was blind, deaf, and without taste or touch.

In opposition to the above experiment, the effect produced by the removal of the *optic tubercles* may be usefully brought forward.

The operation of removing the optic tubercles was invariably attended with convulsions. If the optic tubercle on one side only was removed, the opposite eye immediately became blind. In one bird in which M. Flourens removed both tubercles, blindness immediately followed; and one bird thus mutilated, though perfectly blind, three or four days after the operation, went about in search of food, sought the place of rest in the evening, received the caresses of the male and responded to them, avoided the objects that it had once struck, advancing with precaution; it pecked the ground as it walked about, swallowing the grain and rejecting the pebbles; it soon learned and remembered the places where it ordinarily received its food; the cautious animal conducted itself, in fact, under all the circumstances, with an intelligence more decided and continual, inasmuch as, having lost the sense of sight, it was obliged to supply that loss by means of its other senses, directed by intellectual faculties.

M. Flourens, in order to prove the office of the cerebellum, removed it in a pigeon by successive slices. The removal of the first pieces merely appeared to weaken the bird, and to produce some irregularity and want of harmony in the action of the muscles of the limbs. On reaching the middle of the cerebellum, it manifested a universal agitation, but heard and saw

everything perfectly. When the whole was removed, it no longer had the power of walking or flying; and placed upon its back, it was unable to raise itself; but far from remaining quiet and calm, as in a pigeon from which the hemispheres were removed, it constantly made vain and ill-regulated attempts to rise: if it was threatened, or a pretence made to strike it, it endeavoured to avoid the blow. Finally, volition and sensation remained, as did also the power of exciting the contraction of the muscles; but the faculty of producing harmonious and regularly combined movements no no longer remained.

Bouillaud, in a pamphlet entitled "Recherches cliniques et experimentales tendant à refuter l'Opinion de M. Gall sur les Fonctions du Cervelet, et à prouver que cet Organe préside aux Actes de l'Equilibration, de la Station, et de la Progression," advances some opinions which, to a certain extent, are at variance with those of M. Flourens on the same subject, inasmuch as he considers that the regulating power of the cerebellum is confined to the muscles of locomotion, and that it has no power over voluntary movements.

"Mutilations of the cerebellum," says M. Bouillaud, "were not accompanied by paralysis or convulsions, properly so called, but merely by disorder of the locomotive functions; the faculties of equilibrium and progression were destroyed. The animals mutilated were still capable of reflection, of hearing, of moving their limbs in all directions, and most frequently these movements were executed with extraordinary quickness and violence; from which it follows," says M. Bouillaud, "that we must admit the existence in the

cerebellum of a force which presides over the association of the movements composing the different acts of locomotion and of station—a force essentially distinct from that which governs the simple movements both of the trunk and limbs, although there exists the most intimate connection between the two.

"In this view of the subject, it is impossible not to adopt the opinion of M. Flourens, namely, that in the cerebellum resides the power of co-ordinating the actions of walking, running, flying, standing, &c. But M. Flourens appears to have fallen into an error, when he says that the cerebellum is the co-ordinator of all the movements called voluntary.

"Up to this time, experiments only warrant our saying, that the cerebellum is the central nervous organ, which gives to vertebrated animals the faculty of preserving their equilibrium and of exercising the various acts of locomotion. Besides, I think I have proved in another memoir, that the cerebellum co-ordinates certain movements, those of speech in particular, more marvellous than those of which we are here treating.

"The disorders of the functions of station and progression are not the same, whether the cerebellum is simply irritated or partly disorganized, or entirely destroyed. If the cerebellum is only irritated, its functions are not destroyed, but are thrown into confusion, if I may so express it, for a certain time. It is in this state that we observe jumping, falling heels over head, whirling, and all the puzzling movements which are executed with such impetuosity that the eye cannot follow them, which renders a description of these movements very difficult. It is also in this state that we

observe that violent agitation so much like epilepsy. These phenomena do not appear to have been observed by M. Flourens in all their shades, undoubtedly because he always conducted his experiments by the ablation of parts. They have been found especially remarkable in birds; they are also to be observed in the mammalia. These phenomena evidently indicate a lesion of the functions of station and locomotion; they are irresistible. But this disorder, this species of *alienation* of the locomotive movements, soon disappears when the irritation is not continued; so that the animal gradually regains its proper attitude and normal gait.

"It is not so when the cerebellum is totally disorganized or entirely removed; the animal is then for ever deprived of the faculty of equilibration, of walking, and of flying, if a bird; all the efforts it makes are useless; they merely demonstrate, that though unable to perform any combined motions out of which station or locomotion results, it nevertheless retains the faculty of executing partial movements, and of moving its limbs in all directions."

Such are some of the opinions of the most celebrated continental experimentalists on the brain.—Many of their best-founded opinions are in harmony with phrenology; and those which are in direct opposition to the phrenological system are contradictory, and consequently cannot be depended upon.

THE END.

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